nce Library

The OIL AND GAS JOURNAL

For more footage per round trip...

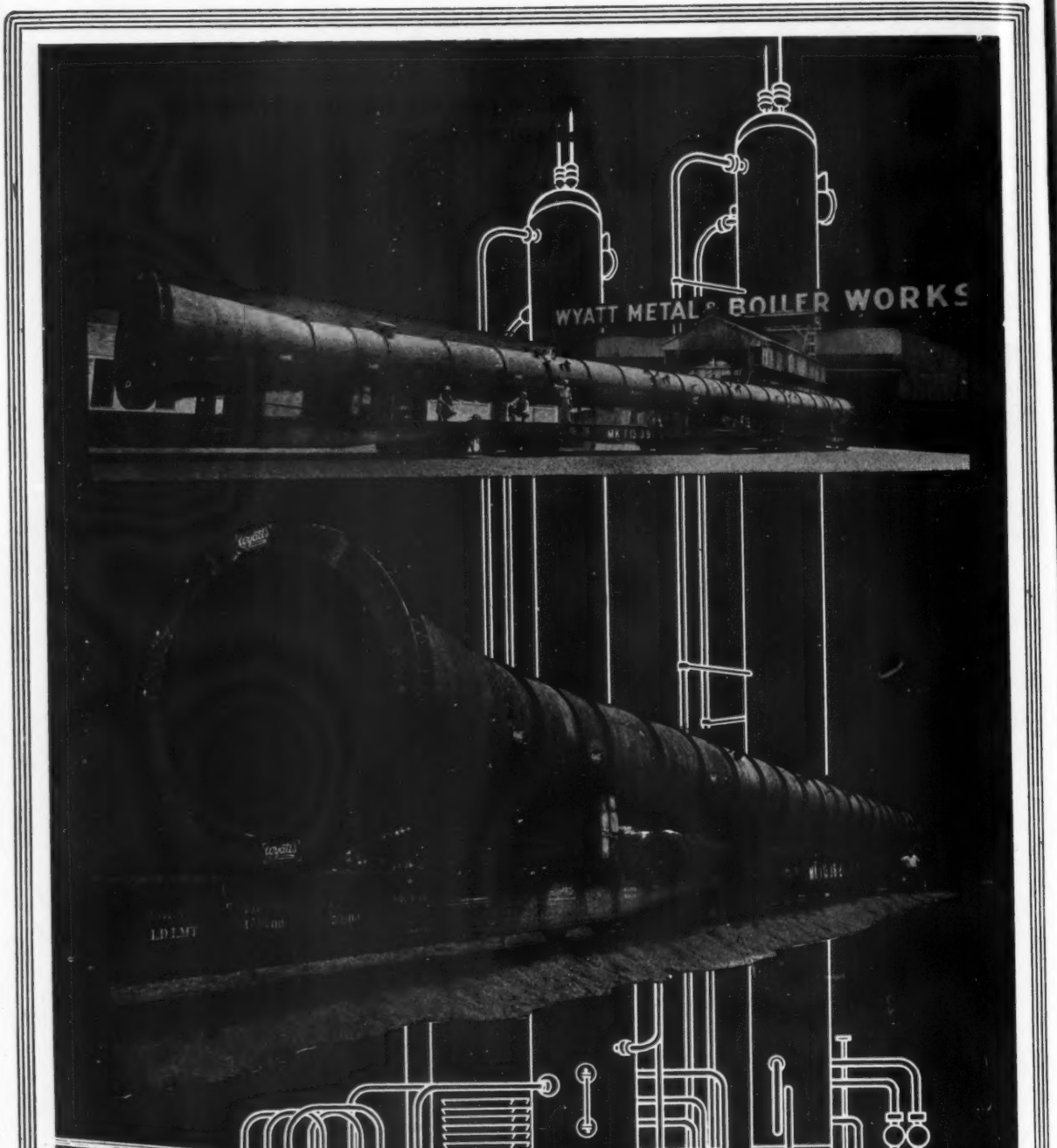
EXPERTS CHOOSE HUGHES

ORTIFIED GAGE!

ne of this decade's most significant developments for illing hard abrasive formations is the Hughes W7-R Tri-Cone ck Bit which embodies the exclusive Hughes Type "R" web sign gage surface. This Type "R" circumferential crested gage web events the rock teeth, generated on bottom by the outside row of teeth, from ning the wall of the hole and provides a broad surface for the application "Hughesite" gage metal . . . *another* "Engineered Solution" by HUGHES!

HUGHES TOOL COMPANY
HOUSTON, TEXAS
Standard of the Industry

PRICE 20 CENTS TABLE OF CONTENTS PAGE 53 AUGUST 9, 1947



Fabricating towers to rigid specifications for modern petroleum refining requires technical "know-how" gained from years of experience plus proved methods and superior plant facilities.

•

WYATT METAL & BOILER WORKS

the OIL AND GAS JOURNAL

published weekly by the

PETROLEUM PUBLISHING COMPANY

211 S. CHEYENNE AVE., TULSA 1, OKLAHOMA

FOUNDED IN 1910 BY PATRICK C. BOYLE

Subscription rate to the petroleum industry, United States and foreign, 1 year, $3.00. Single copies, 20 cents. Back copies, when over a year old, 50 cents. Note: Payments from outside the U.S.A. may be in the form of an international money order or check on a U.S.A. bank. Entered as second-class mail matter at Tulsa, Okla., under Act of March 3, 1879. Copyright 1947 by The Petroleum Publishing Co.

Vol. 46, No. 14 August 9, 1947

P. C. LAUINGER, *President*
C. O. WILLSON, *Editor*
S. H. ROURKE, *Business Manager*
KENNETH B. BARNES, *Engineering Editor*
R. C. MAC DOUGALL, *Circulation Manager*
ARCH L. FOSTER, *Refining Editor*
W. L. NELSON, *Technical Editor*
PAUL REED, *Pipe-Line Editor*

Associate Editors

LYNN M. NICHOLS
NEIL WILLIAMS
CHARLES J. DEEGAN
R. B. TUTTLE
DAHL M. DUFF
D. H. STORMONT

C. DUDLEY JOHNSTON, *Staff Artist*

District Editors

T. A. ARMSTRONG, TRUMAN P. MOOTE — Tulsa 1, *211 S. Cheyenne*
GEORGE WEBER, CARL F. HOOT — Dallas 1, *Mercantile Bank Bldg.*
LEIGH S. McCASLIN, JR. — Tulsa 1, *211 S. Cheyenne*
O. C. PRESSPRICH — Saginaw, *News Bldg.*
E. H. SHORT, JR. — Houston 2, *Sterling Bldg.*
HERNDON DAVID — Los Angeles 15, *1406 S. Grand Ave.*
WARREN W. BURNS — New York 17, *415 Lexington*
HENRY D. RALPH — Washington 4, *Nat'l Press Bldg.*
TOLBERT R. INGRAM — Denver 11, *4558 Alcott St.*
VICTOR LAURISTON — Chatham, Ont., *35 Stanley Ave.*

P. DE ARMOND, *Editorial Assistant*

Advertising

WAYNE RIVES, *Manager*

MITCHELL TUCKER, *Eastern Manager* — New York 17, *415 Lexington Ave.*
C. R. FARMER, *Chicago Manager* — Chicago 2, *105 W. Madison*
ALFRED MILTON JONES, *New York Representative* — New York 17, *415 Lexington Ave.*
E. S. KLAPPENBACH, *Chicago Representative* — Chicago 2, *105 W. Madison*
J. HOWARD TINKHAM, *California Manager* — Los Angeles 15, *1406 S. Grand Ave.*
CHARLES A. WARDLEY, *Pittsburgh Manager* — Pittsburgh, *435 Fourth Ave.*
JOHN D. REILLY, *Tulsa Representative* — Tulsa 1, *211 S. Cheyenne Ave.*
J. PARKER HOLLAND, *Production Manager* — Tulsa 1, *211 S. Cheyenne Ave.*

A. J. CHAMBERS
Beckingham, Kent, England
33, The Avenue

Member
Audit Bureau of Circulations
Associated Business Papers

Table of Contents

NEWS DEVELOPMENTS

Sunray Bid Apparent High for U. S. Plant 56
Carter Suspends Billings Refinery Building 56
Continental Planning Billings Refinery 56
Record Gas Withdrawals Indicated for Texas This Year 57
Control of Maort Is Assumed by Hungary 61
Full-Scale Exploration Under Way in Alaska 62
Overproduction Charged, Kansas Gas Wells Closed 73
Major Oil Supply from Imports Unlikely, Official Says 75
Legislation in Tidelands Case May Be Sought 76
Optimism on Supply Marks Bureau Forecast 76

Editorial 55
This Week 59
International News 60
Watching Washington 70
Refining News 115
Pipe-Line News 119
Natural-Gas News 122
Natural-Gasoline News 122

ENGINEERING AND OPERATING

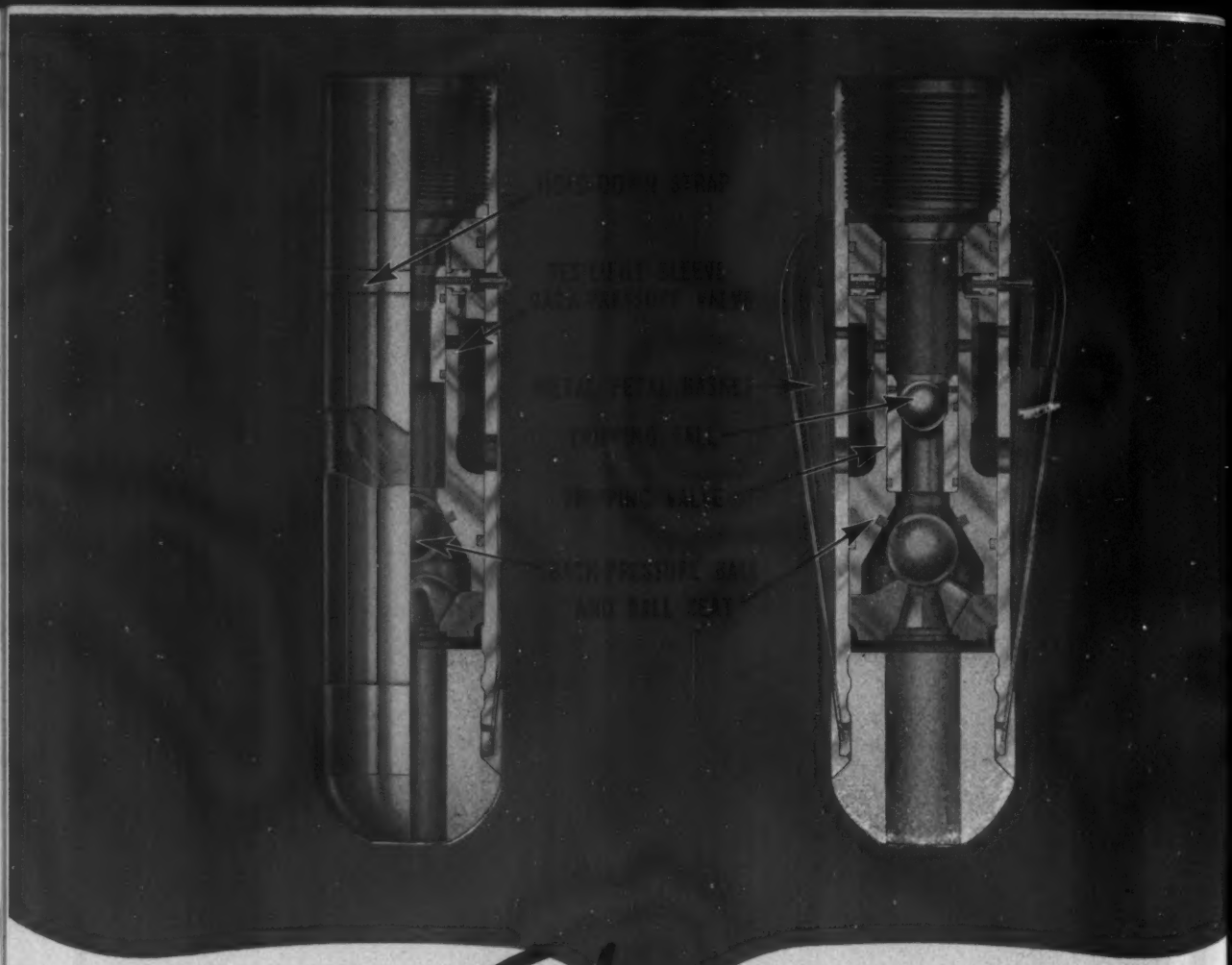
Midget Catalytic Cracker Starts Operation at Detroit 80
Prefabricated Offshore Drilling Platform 82
Accurate, Continuous Elevations at Automobile Speeds 86
Stanolind Line Crosses Arkansas 12 Ft. Below Stream Bed 92
Safety Color Code for Drilling Rigs 94
Copper-Strip Corrosion Tests 99
Portland Cements in the Oil Industry 101
Book Reviews 107
Questions on Technology 108
Modern Rotary Drilling—No. 32 in a Series 109
The Refiner's Notebook—No. 156 in a Series 111
Engineering Fundamentals—No. 295 in a Series 113

EXPLORATION AND DRILLING

Goliad County Strike 125
Reports by Areas Start on Page 125
Weekly Well-Completion Record 148
Daily Average Production for Week 149

ADDITIONAL FEATURES

Personals 77
Deaths in the Industry 79
Drilling Contractors 143
Market Summary 148
Equipment Men in News 150
Classified Advertising 152
Calendar of Events 156
Advertisers' Index 156



THE BAKER *Triplex* CEMENTING SHOE does an important job...and does it well!

The "Triple" purpose of the Baker TRIPLEX Cementing Shoe is to pack-off in large-diameter, or irregularly-shaped holes, retain all cement slurry above the shoe, and protect permeable, low-pressure formations below from cement contamination.

All cement slurry is directed upward through side whirler ports. A sleeve-type, resilient rubber back-pressure valve opens readily to permit passage of the slurry into the annulus around the shoe, but closes instantly to prevent any return flow of slurry. The Baker Metal Petal Basket is intended to form a bridge, thus preventing cement slurry from settling into permeable, low-pressure zones below. The Basket is indispensable in large-diameter, or irregular-shaped holes.

The Baker TRIPLEX Cementing Shoe (Product No. 136) operates as a conventional float shoe while running-in the casing. Then, after reaching the desired point in the hole, circulation is established through the ample interior passageway of the shoe, and the hole is conditioned preparatory to cementing. The Tripping Ball now is pumped (or allowed to gravitate) down the hole to seat upon the Tripping Valve. A pressure of 400 to 500 psi is applied to the casing which shears the screws in the Tripping Valve, permitting it to move downward and expose the cementing ports. Shearing these screws also releases the hold-down strap around the basket, allowing the basket to expand outwardly against the wall of the hole. The cementing operation is then carried out in the conventional manner with all cement slurry directed upward and held above the shoe by the expanded Baker Metal Petal Basket.

The Baker TRIPLEX Cementing Shoe consists of a whirler float shoe with a Baker Metal Petal Basket fastened on the shoe below the cementing ports. All internal parts are made of readily drillable materials. Two one-half inch set screws hold the inner assembly stationary to facilitate drilling out the shoe.

Contact your nearest Baker office or representative for details and recommendations.

BAKER
OIL TOOLS

BAKER OIL TOOLS, INC., LOS ANGELES • HOUSTON • NEW YORK

THE OIL AND GAS JOURNAL

Oil Industry Speaks Out

FOR the first time in its 88-year history, the oil industry, as a unit, is presenting a message this month to the American people. Through paid advertising in four magazines of large popular circulation, it boldly offers its initial theme of "Understand Rivalry and You Understand America."

There are those who will not like the text and who will make light of the supporting facts taken from the oil industry's operations. They profess to believe that competitive enterprise is outmoded. They submit various substitutes, all of foreign origin, where they don't understand the American system because they have never given it a trial. They offer stagnation or retrogression as a substitute for progress, and authoritarian controls for industrial and individual freedom.

But these are minorities, and the messages sent directly to tens of millions of American consumers are directed to those who can understand rivalry because they practice it and derive strength and benefits from its applications. They know that our standard of living, not approached in any other part of the world, springs from it and cannot be maintained without it.

An opinion poll of a year ago showed that the public was not convinced that rivalry actually exists in the oil industry. The average consumer thought in terms of a few trade names, having no conception of the actual workings of a national and international industry with its thousands of operating units. So the advertisements point out that the oil industry is made up of 34,000 individual firms.

Some consumers had not realized it before, but there are 20,000 jobbers and distributors competing for business in small and large communities, and oil products are distributed through 225,000 service stations.

And then there is progress. As an example, mention is made of directional drilling, which aids in finding oil. Our tankers, with 650 companies engaged in all types of transportation, have increased their speeds 50 per cent. Consumers are constantly benefiting from the initiative, technical skills, and research of this industry.

All these facts and more have been presented many times to Washington investigators of the oil industry. Those who sought to make political capital from monopoly found that it did not exist. The oil business has always presented a good defense to the charges brought against it.

But the industry's public-relations program is an offensive action. If successful, defense no longer will be necessary. A good start has been made. A coordinated program has been outlined which extends to the grass roots of industrial and public relations and which is deserving of full-scale support from all branches of the oil business.

PETROLEUM—A *PROGRESSIVE* INDUSTRY

Sunray Bid Apparent High for U. S. Plant; Development Planned

SUNRAY OIL CORP. made an apparently high offer for the government-owned aviation-gasoline refinery at Beckett, Okla., August 4 when bids for the property were opened by War Assets Administration officials in Tulsa.

The company immediately announced plans, contingent on acceptance of its offer by WAA's real-property disposal board in Washington, to build distillation facilities at the plant and to link the property with its present refinery at Allen, Okla., by a 93-mile 6-in. pipe line.

The government-built refinery is located at Beckett, about 5 miles south of Duncan. It was built at a cost of about $14,212,000 and was operated during the war as a cooperative high-octane cracking project by eight Mid-Continent companies as Associated Refiners, Inc.

Sunray submitted two bids, each of which appeared to be high. One was for $5,100,000 calling for outright purchase for use in place. The other was a lease arrangement under which the company will pay over a 10-year period approximately $500,000 annually, the exact amount based on throughput.

WAA officials indicated a final decision on the offers would be made in about 3 weeks after all bids and varying conditions in the offers are analyzed. Other bids submitted were by British-American Oil Co., Ltd., Rock Island Oil & Refining Co., Continental Oil Co., Skelly Oil Co., and Anderson-Prichard Oil Co.

Sunray Production Adequate

Acquisition of the government plant will give Sunray better-balanced over-all integrated operations, officials said. C. H. Wright, president, said the company's gross crude-oil production during July exceeded 47,000 bbl. daily. Of this total, approximately 42,000 bbl. daily is being produced in the areas east of the Rockies. Sunray operates the 14,000-bbl. daily Allen refinery with thermal cracking equipment, and a 7,500-bbl. daily refinery at Santa Maria, Calif.

The Beckett plant consists of a Fluid catalytic cracking unit of about 10,700 bbl. daily capacity at 80 per cent conversion, an HF alkylation unit of about 2,200 bbl. daily, and smaller isomerization and gas concentration units. Auxiliary facilities include an Ethyl blending plant and storage tank capacity for 580,000 bbl.

Pipe for the 93-mile line between Allen and Beckett was purchased by Sunray from Great Lakes Pipe Line Co. *(See page 121).* If the purchase of the government plant is consummated, Sunray plans to move some 4,000 bbl. daily of gas oil as charging stock through the line in a batching operation. A second movement will carry gasoline to the Allen refinery which in April was linked into the Great Lakes company's product system by completion of an 8-in. Allen-Drumright line.

Floyd L. Martin, Sunray vice president in charge of refining, emphasized the line would serve solely as a connecting link between the two refineries, serving to tie in the refining operations. Cost of the line will be about $1,200,000.

At Beckett, Sunray is planning topping and vacuum units of 15,000 to 20,000-bbl. daily capacity. The Allen pipe line would supply about one-third of the feed for the cracking units; new facilities to be built at Beckett, the remainder.

Martin estimated the conversion and additional facilities at Beckett could be completed in 9 to 10 months after the acceptance of the bid. The pipe line, he added, probably would be completed in about 4 months.

Company officials pointed out the company's crude supply is more than adequate to support the proposed new operations. Short connecting lines to nearby crude-oil lines and exchanges with other producers would provide crude oil at Beckett.

Carter Stops Construction at Billings

POSSIBILITY that Carter Oil Co. might abandon its plans to build a 20,000-bbl. refinery near Billings, Mont., at least temporarily, was seen early this week following a "stop-construction" order on the project.

Rising construction costs were cited by R. B. Curran, Carter vice president and northwest division manager, in the shutdown order.

Company officials indicated that a 30-day period of studying cost estimates and other factors will be required before a decision will be reached on whether or not construction will continue.

Curran said the company will "make a reappraisal of costs" to determine "whether construction can be justified at this time."

Curran said the original cost estimate made in 1946 was $10,000,000. In March of this year, he said, rising costs had boosted the figure to $16,500,000, and more recent studies have indicated the cost will be much greater than this latter figure.

Grading of the 344-acre refinery site, 3 miles east of Billings, already has been completed, and the company has done considerable work in preparing foundations for processing units. Contractors had planned to have all 1,800 reinforced pilings in place by November.

The refinery, scheduled for completion late in 1948, will, if completed, be the largest in the Rocky Mountain states. Plans called for catalytic cracking and auxiliary facilities. Storage facilities of 1,600,000-bbl. capacity were planned for handling 35 different grades and types of products.

At normal capacity, operation was designed to produce 366,000 gal. of gasoline, 3,000 bbl. of fuel oils, and 1,400 bbl. of asphalts daily. Major contractor on project is Fluor Corp., Ltd.

Continental Planning Billings Refinery

CONTINENTAL OIL CO. early this week was reported completing plans for construction of a refinery of 8,000 to 10,000 bbl. capacity near Billings, Mont.

The company has owned a refinery site near Billings for several years. Date on which construction is scheduled to begin was not announced but was expected to be revealed before mid-August.

The project will considerably increase Continental's refining capacity in the area, coming within a few months after the company's announcement of plans to boost the capacity of its Denver refinery from 3,200 to 8,000 bbl. or more.

Changes there already are under way and are expected to cost in excess of $4,000,000.

In making its initial announcement of changes in the Denver refinery, Continental said the project was designed to help meet expanding requirements for gasoline and other products in the Rocky Mountain area and provide greater outlet for greatly increased crude production in Wyoming. Continental has been market leader in Rocky Mountain territory for more than 25 years.

Continental's daily average production in 1946 was 95,836 bbl., and late in the year frequently exceeded 100,000 bbl. The company has considerable production in the Rocky Mountains.

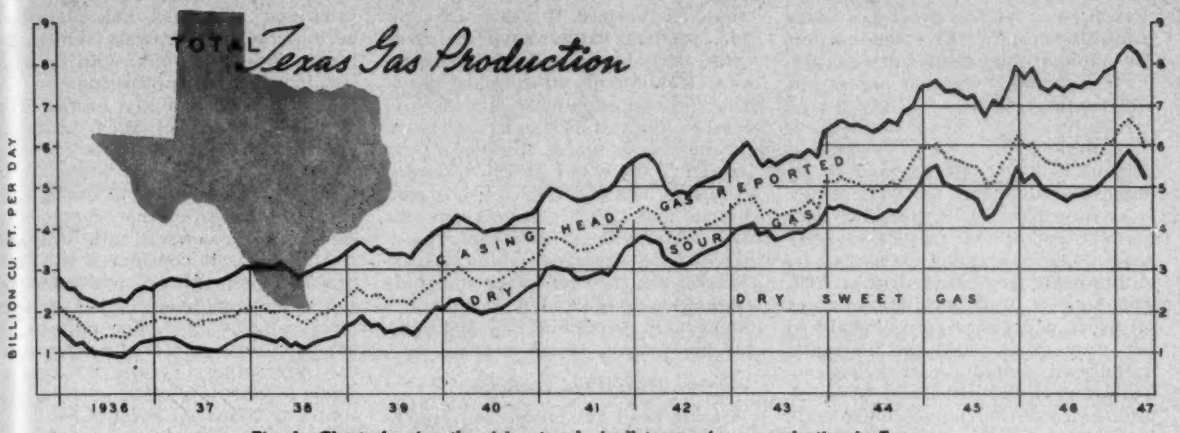


Fig. 1—Chart showing the rising trend of all types of gas production in Texas

Record Gas Withdrawls Indicated For Texas This Year

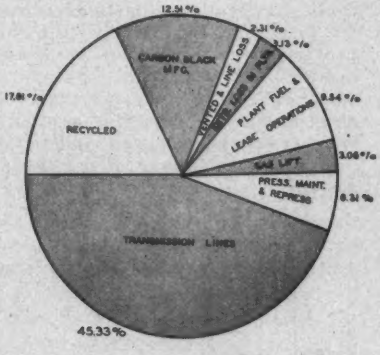
by George Weber

FOLLOWING a record production of gas in 1946, Texas shows all indications of setting new highs for withdrawals of all types of gas in 1947 and possibly for the next several years. February of this year saw gas withdrawals reach an all-time peak, averaging 8,450,000,000 cu. ft. daily, of which 5,900,000,000 cu. ft. was dry sweet gas, 780,000,000 cu. ft. dry sour gas, and 1,780,000,000 cu. ft. reported casing-head gas. This rate is roughly three times the production average 10 years ago.

Improved utilization of natural gas is keeping pace with the increased rates of production. A concerted drive by producers, and pipe-line companies under the leadership of the Texas Railroad Commission, to reduce waste gas to an economic minimum is reflected in the projection of 69 casing-head gas conservation projects, some completed and the remainder in all stages of construction and planning. Further utilization of casing-head gas will be given impetus by extension of gathering facilities for residue gas and an expected rise in field prices for such gas, based on an apparently insatiable demand for fuel from areas outside the state. Waste of gas from gas wells is nil at the present time, since production allowables are based on full utilization of such gas.

Factors Accounting for Increase

Several factors have accounted for the steady increase of Texas gas production, and will continue to influence still higher withdrawals in the future. Exploration at continually greater depths has resulted in a growing percentage of gas condensate discoveries during the past decade. This trend, accompanied by the rapid growth of cycling projects has accounted for a sizeable share of with-



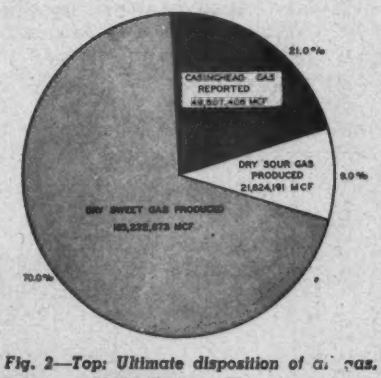


Fig. 2—Top: Ultimate disposition of all gas, February 1947. Bottom: Character of gas production during the record production month of February 1947

ULTIMATE DISPOSITION OF ALL TEXAS GAS BY YEARS

(Figures in million cubic feet)

Year	Total produced	Pipe line	Extraction loss	Plant fuel and lease operations	Recycling, repressuring, and pressure maintenance	Vented	Carbon black	Gas lift
1939	1,298,307	462,072	50,891	170 853	105,438	142,403	316,804	49,846
1940	1,544,089	494,826	56,210	216,583	265,677	132,740	326,050	52,003
1941	1,817,150	559,279	71,667	213,391	481,607	101,147	329,361	60,698
1942	1,916,825	683,473	65 692	193,204	531,164	81,988	295,612	62,692
1943	2,182,064	821,511	72,175	218,526	*483,643 †139,247	91,121	274,507	81,334
1944	2,477,698	1,022,181	80,628	238,035	*491,905 †134,803	111,563	295,953	102,630
1945	2,670,945	1,092,826	87,614	262,008	*514,193 †131,624	118,060	369,124	95,496
1946	2,768,865	1,122,500	89,465	268,082	*496,284 †200,662	108,485	388,261	95,126
First 4 months 1947	975,927	417,366	31,328	94,949	*178,122 †66,752	26,357	129,680	31,373

*Recycled gas. †Gas returned by repressuring and pressure maintenance.

drawal gains for dry sweet gas. Large transmission networks extending into the state have augmented dry-gas production during the same period and will continue to do so in the future. In addition, gas conversion to motor fuel and chemicals, will swell local demand as will expected gains in demand for fuel from Texas industry.

As shown in Fig. 1, compiled from periodic reports of the Texas Railroad Commission, daily average gas withdrawals have trebled since 1936. The bulk of that gain was realized in sweet dry gas. Approximately 35 per cent of all such gas currently withdrawn is produced from gas-condensate reservoirs, the bulk of which, after extraction of liquid components, is returned to the reservoirs. Transmission systems continue to take a greater share of all gas, about 45 per cent is currently going to pipe lines for light and fuel. Of this flow, approximately 40 per cent is moving outside Texas and this percentage of export gas will rise considerably on completion of pipe-line and gathering system projects now under way.

From the standpoint of products of gas, the state shows a threefold increase in the past 10 years. In addition, product values have improved with rising prices and the trend toward manufacture of specialty products and deeper cuts of propane and butanes. This is particularly true in cycling plants, where the normal extraction process is logically extended to include fractionation of crude condensate into L.P.G. gasoline, solvents, fuel oil, and other specialized products whose aggregate value greatly exceeds the market price of crude condensate as such. Fig. 3 illustrates the gains in gasoline, L.P.G. and other gas products in recent years.

Three-Fold Increase

Casing-head gas production reported to the Railroad Commission has also multiplied three-fold during the past 11 years, reaching a record high of 1.98 billion cubic feet per day during April of this year. Much of the increase has attended greater crude-oil withdrawals. In recent years, casing-head gas production has been curbed to some extent by limitations on oil production at high gas-oil ratios. The wider adoption of repressuring and pressure-maintenance programs, using gas, has augmented permissible withdrawals which are returned to reservoirs, with or without intermediate processing.

Gas prices, currently estimated to average 5 cents per M.c.f. in Texas, are the important ultimate factor in net withdrawals from state fields. Compulsory utilization of casing-head gas must hinge on the economics of gathering, processing, and transmitting such gas to consumers at a reasonable profit. Rising prices for dry gas will promote development of such reserves. The price for dry gas is expected to show a continued rise for the next several years. At present, some buyers are offering long-term contracts based on 8 cents per M.c.f. Recently the utilization of dry sweet gas for carbon black manufacture was authorized, provided the price corresponds to local scheduled prices for such gas to other buyers. Greater flexibility of gas production has also recently been authorized, whereby large withdrawals may be made from gas fields during high winter demand months, offset by reduced production in summer.

Currently, natural-gasoline plants account for about 74 per cent of natural-gasoline produced in the state, and cycling plants produce the remaining 26 per cent. About 30 per cent of all L.P.G. products derived directly from natural gas come from cycling plants which produce 70 per cent of the special products listed as "other."

At the latest report, 145 natural-gasoline plans were in operation in the state. In addition, 48 other plants are reported, including repressuring and pressure-maintenance units, dehydrating plants, drips, scrubbers and all other classifications of plants processing gas for extraction of hydrocarbon liquids. Nonprocessing pressure-maintenance and repressuring plants number 139 as of April 1947. During the same month, a total of 31 cycling projects were in operation in the state.

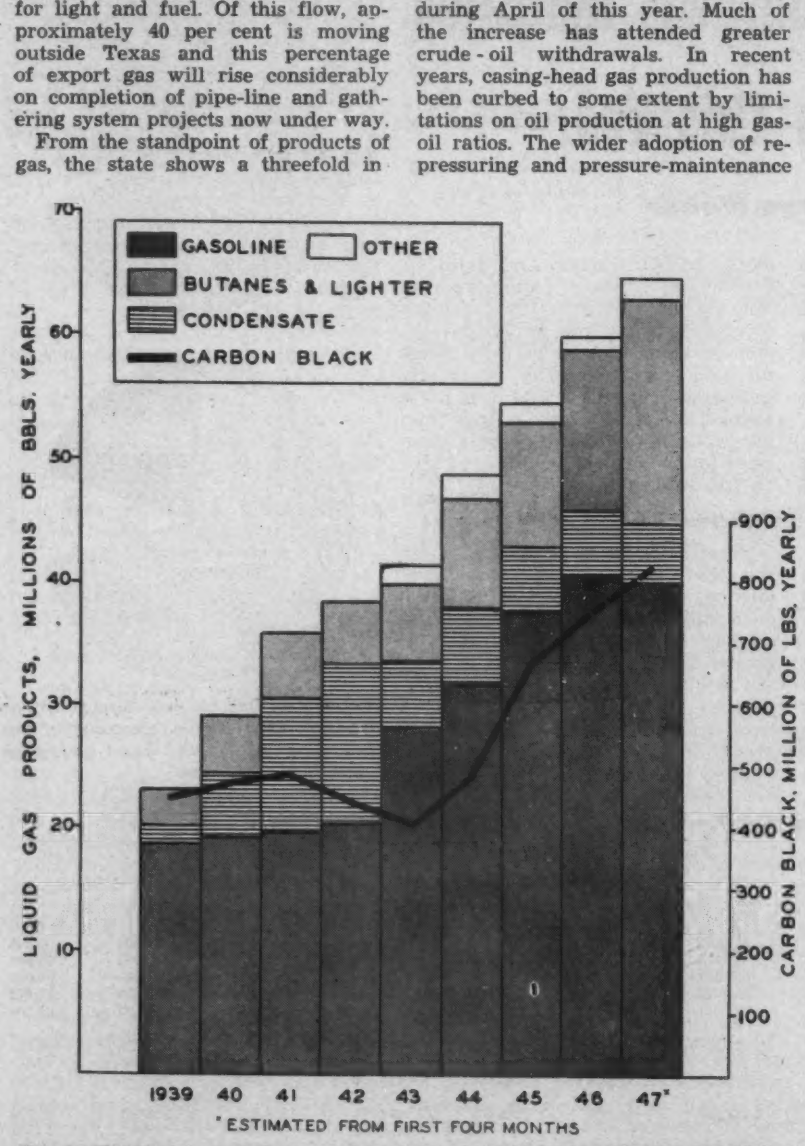


Fig. 3—Illustrated here is the increasing output of gas-processing plants as reported to the Texas Railroad Commission, breaking down major types of products

Automobile Association Urges Moderate Driving

The American Automobile Association is urging motorists to avoid excessive speeds and quick starts in order to cut down on the consumption of gasoline.

The association said millions of gallons of motor fuel could be saved without interfering with automobile usage. It cited tests showing an automobile at 60 m.p.h. consumes 58 per cent more gasoline than one averaging 40 m.p.h.

Though there is no gasoline "famine," the situation in regard to the supply of motor fuel is tight and will continue so for the next month or two during the peak-consuming season, A.A.A. said.

this week

REFINING—Carter Oil confirms reports it has suspended work on new 22,000-bbl. daily refinery at Billings, Mont. Company officials cite rapidly rising price trends and say situation will be studied to determine if constructon, now in the preliminary foundation stage, will be continued . . . ¶Continental Oil reported planning new refinery of 8,000 to 10,000 bbl. daily at Billings on site bought about 10 years ago. . . . ¶Sunray makes apparent high bid for government-owned high-octane plant operated during the war at Beckett, Okla., by Associated Refiners. . . . Company reveals plans to construct 93-mile line between Allen, Okla., refinery and Beckett, and to install distillation facilities at Beckett if bid is accepted. . . .

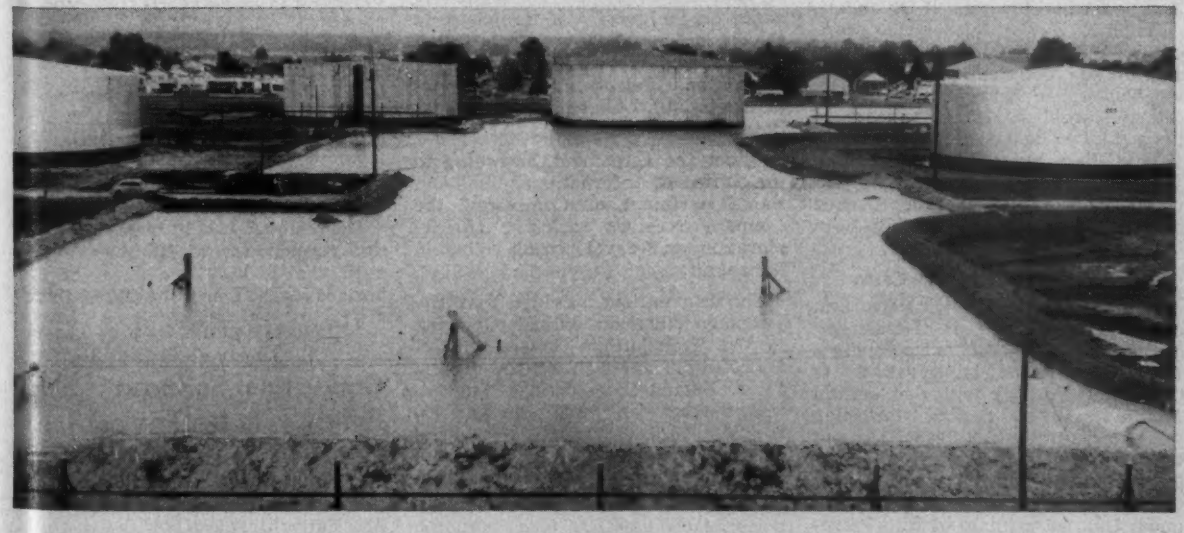
INTERNATIONAL—Phillips Petroleum, 11 independent companies disclosed to be considering organization of a joint company to enter Middle East development. . . . Ralph K. Davies reported approached to head new organization. . . Incorporation papers filed in Delaware for American Independent Oil Co., with reports saying total capital of about $1,000,000,000 will be needed for venture. . . .. ¶Hungarian Government takes virtual control of Maort, Jersey subsidiary, by decree setting minimum production and price. . . . Paul Ruedemann, Maort director, says production rate will ruin the field. . . .

SUPPLY AND DEMAND—Bureau of Mines forecasts August crude-oil demand of 5,152,000 bbl. daily, contrasted to estimated demand of 5,160,000 bbl. daily in July and 5,130,000 bbl. daily in June. . . . ¶Monthly bureau forecast takes optimistic tone in regard to supply, says requirements, both for consumption an fuel-oil stock buildup, will be met if current high level of production is maintained by nation's refineries. . . .

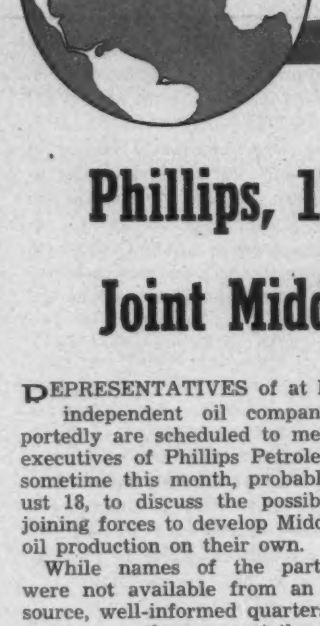
NATURAL GAS—Tennessee Gas Transmission Co. receives Federal Power Commission approval to construct additional facilities costing approximately $55,000,000. . . . Project includes 492 miles of 26-in., 69 miles of 24-in., and 82 miles of 20-in., all loops east of Natchitoches; a Mississippi River aerial crossing, new compressor station in Nueces County, Texas; and 83-mile, 20-in. lateral to Carthage field. . . . ¶FPC authorizes 71-mile, 20-in. line in Pennsylvania to be built by United Natural Gas to receive supplies from the Inch system. . . . ¶FPC approval also given Hope Natural Gas project to construct facilities in West Virginia to take an additional 50,000,000 cu. ft. daily from T.G.T. . . .

EXPLORATION—Weekly well completions in the United States reach new record high of 780 wells which compares with previous record of 720 wells completed in week ended September 25, 1937. . . . ¶Gulf Coast area gets three new pools and three new pays out of 12 exploratory completions. . . . ¶Sinclair Prairie and Atlantic Ellenburger test in Crockett County, Texas, flows 1,232 bbl. oil per day. . . . ¶Second pay zone in Caddo discovery in Throckmorton County, Texas, flows 50 bbl. oil per hour. . . . ¶Ora field, Union Parish, Louisiana, extended 2 miles. . . .

LABOR—"Escalator clause," based on Bureau of Labor Statistics' cost-of-living index, dropped from Sinclair Oil Co. contract with Oil Workers International Union. . . . Flat 25-cent hourly increase substituted. . . . Contract made effective until July 1, 1948. . . . ¶Work stoppage by drillers and roustabouts in South Texas fields called by union in effort to gain union recognition for some 1,500 men. . . .



TANKS GO SWIMMING—*At the Standard Oil Co. of New Jersey, Louisiana Division, refinery at Baton Rouge, four 65,000-bbl. storage tanks recently were floated to new locations in an artificial lake created for the purpose. The tanks were moved to make room for a new sales department building and bulk station to be completed early in November. The tanks, each 35 ft. high and 115 ft. in diameter and weighing empty about 500 tons, were floated in about 24 in. of water. About 5,750,000 gal. of water were required for each moving job. Of the four tanks, two were floated about 100 ft. each, one 700 ft., and the fourth, 400 ft.*



International

WORLD-WIDE OIL DEVELOPMENTS

Phillips, 11 Others Consider Joint Middle East Company

REPRESENTATIVES of at least 11 independent oil companies reportedly are scheduled to meet with executives of Phillips Petroleum Co. sometime this month, probably August 18, to discuss the possibility of joining forces to develop Middle East oil production on their own.

While names of the participants were not available from an official source, well-informed quarters stated that among the group at the meeting probably would be the following:

Globe Oil & Refining Co., Hancock Oil Co. of California, Ashland Oil & Refining Co., Sunray Oil Corp., Signal Oil & Gas Co., Honolulu Oil Corp., Premier Oil Refining Co., and Kerr-McGee Oil Industries, Inc., and the so-called Batson interests. Lee Batson is the California trustee of the Edward L. Doheny oil properties. Robert Kerr is former governor of Oklahoma.

Ralph K. Davies, former vice president of Standard Oil Co. of California and deputy petroleum administrator for war under former Interior Secretary Harold L. Ickes, appears to be a likely candidate to head this Middle East venture. Contacted in Washington late last week he explained that he had been approached but that no final decision has been made.

Geologist En Route to Cairo

Sources close to Phillips Petroleum confirmed that N. P. Isenberger, geologist in charge of that company's foreign activities, is en route to Cairo and probably will visit certain Middle East oil regions—including the two neutral zones, Iraq Nejd and Kuwait Nejd, and possibly areas in Hejaz and Asir both of which border on the Red Sea. Petroleum Development, Ltd., an affiliate of Iraq Petroleum Co., Ltd., formerly held concessions in Hejaz and Asir but has since surrendered them.

That the Kingdom of Yemen, which also borders the Red Sea, may become an area for Middle East oil exploration appears more than a remote possibility. Prince Saif al Islam Abdullah of Yemen is now on an economic mission to the United States.

Whether Phillips Petroleum and other independent participants will join forces under the newly incorporated name of American Independent Oil Co. is not yet known. However, papers were filed in Delaware about a month ago, and preliminary reports indicated that the company might be capitalized at $50,000,000. Other indications are that resources of around $1,000,000,000 will be needed with individual guarantees of $50,000,000 on up, by the participants.

Reports that Arabian American Oil Co. might give up part of its Saudi Arabian concession of 435,000 sq. miles or part of its preferential rights on another 117,000 sq. miles in Saudi Arabia, appear unfounded. However, if the Phillips interests indicate an interest in the Iraq-Nejd and Kuwait-Nejd neutral zones then it may be necessary to obtain Aramco consent as Aramco holds preferential rights to 50 per cent of the areas in both zones.

Should the newly formed American Independent Oil Co. wish to explore the Middle East neutral zones *(The Oil and Gas Journal, May 31, page 112)* it would be necessary to obtain permission from the governments before officially approaching Aramco.

Transjordan Agreement Revealed

GUARANTEED annual payments and a royalty on all oil exported, based on the gravity of the oil, form the basis for the 75-year convention between the Government of Transjordan and Petroleum Development (Transjordan), Ltd., subsidiary of Iraq Petroleum Co., Ltd.

Under the agreement, according to the Office of International Trade of the Department of Commerce, the company receives exclusive oil exploration and development rights in the country.

The convention provides that the company will make annual payments to the Transjordan Government of $123,000 during each of the first 3 years. During the second 3-year period the company will pay $206,000 annually, $329,600 annually during the next period, $494,000 the next, and $659,200 the next.

During this 15-year period if oil exports reach 1,000,000 tons annually, payments will be increased to $824,000. If the exports are in excess of 1,000,000 tons annually and the oil has a gravity of 20° to 25° A.P.I., the payments shall be $1,648,000. If the gravity is between 25° and 35° A.P.I., payments will be $2,472,000, and if above 35°, $3,296,000.

Royalty per barrel ranges from 15 cents for a gravity of 20° and below to about 22 cents for oil above 35° gravity. Total amount due from royalties each year will be deducted from the annual payments, with the balance becoming payable in the first quarter of the following year.

The company will make a lumpsum contribution of $16,240 annually until the 1,000,000-ton level of exports is reached, and of $123,600 thereafter.

Capacity of Formosa Refinery to Be Tripled

Capacity of the refinery at Taichung, Formosa, is to be increased from its present rated output of 6,000 bbl. daily to 17,000 bbl. daily within 18 months, according to the U. S. Office of International Trade.

The refinery, which has skimming, cracking, and lubricating-oil facilities, operates on Arabian crude.

Control of Maort Is Assumed by Hungary

THE Hungarian Government has, by decree, assumed virtual control over the operations of American-Hungarian Oil Co. (Maort), subsidiary of Standard Oil Co. (N. J.), climaxing a 2-year dispute between the company and the government.

In Budapest, Paul Ruedemann, American director of the company, said the government decree sets minimum production for the oil field in southwestern Hungary at 540,000 tons (11,149 bbl.) daily a year and the price of crude oil at $10.20 a ton.

Ruedemann said the production rate will ruin the field in 18 months and declared the established price will result in an operating loss of $14.45 per ton.

Major difference between the government and the company has been the production rate, with company officials striving to operate along scientific rules of conservation and the government insisting on maximum production.

During Russian control, company officials estimated that overproduction caused $25,000,000 damage to the field.

The decree, Ruedemann said, also provides that the company deposit $4.25 a ton in a special blocked account, pending new price discussions, from which withdrawals may be made only by permission of the Hungarian Supreme Economic Council.

The decree further provides, he said, that wells already shut down be reopened and that gas-pressure wells be converted to pumping wells.

The U. S. minister to Hungary has been informed of the latest Soviet-inspired action against MAORT.

Following World War II, the Trianon frontiers of Hungary were re-established and all the properties and economic interests of German firms and individuals in Hungary were turned over to Russia. Among these properties were those of the Jersey Standard affiliate. Protests to date have resulted in little, if any, change. Russia appears determined to gain greater control over all of Hungary's oil operations.

Korea's Products Needs Set at 1,300,000 Bbl.

Korea's civilian economy will require approximately 1,300,000 bbl. of petroleum products in the 12 months' period which began July 1, according to estimates of the Petroleum Distributing Agency functioning under the United States Army Military Government in Korea.

The estimates do not include requirements of the United States military forces and Maritime Commission which are not charged against the Korean civilian economy. Plans are under way to import the fiscal year's requirements under the civilian supply program, according to information from the War Department.

The distributing agency was organized in December 1945 as the successor to Chosen Petroleum Distributing Co., which, with Chosen Petroleum Co., controlled Korea's civilian petroleum industry and market prior to the Japanese surrender. Its activities during 1946 were directed toward maintaining essential phases of the Korean civilian economy.

P.D.A.'s estimates of Korean civilian needs during the fiscal year are:

Gasoline	20,000,000 gal.
Kerosine	12,000,000 gal.
Diesel oil	6,500,000 gal.
Fuel oil	13,400,000 gal.
Lubricating oils	2,760 000 gal.
Greases	684,000 lb
Wax	594,000 lb

Russians Seize Control Of Refinery in Vienna

Soviet military forces took armed possession August 2 of the Lobau oil refinery on the outskirts of Vienna, thus placing Russia in direct control of oil from Zisterdorf field, including derricks in the field and tank barges on the Danube.

The plant was built by the Germans during the war and was owned by a joint subsidiary of two German-incorporated companies of Socony-Vacuum Oil Co. of New York and Anglo-Saxon (Shell) Petroleum Co. of London.

Employes at the refinery, which was seized by three truckloads of Russian riflemen, were told Russia considers the property a German asset under the Potsdam agreement.

The Lobau refinery has been producing about 17,000 tons monthly (3,800 bbl. daily). It is connected by two 30-mile pipe lines to Zisterdorf field.

Work to Start Soon on Venezuela Products Line

Construction of a 10½-mile 8-in. petroleum products pipe line in Venezuela from Catia de la Mar to Nueva Caracas will get under way shortly, according to reports from Creole Petroleum Corp. officials. This line is expected to carry aviation gasoline, motor gasoline, kerosine, and diesel.

Storage tanks with a combined capacity of 219,000 bbl. will be constructed at Catia de la Mar, in addition to seven 30,000-gal. tanks, with 250-psi. pressure for liquefied petroleum gas, also at Catia de la Mar.

Engineering work on the 10½-mile line will be handled by Locatell-Norris & Co. which is headed by R. J. J. Locatell, Atlanta, Ga.

International
WORLD-WIDE OIL DEVELOPMENTS

France Negotiating for Propane and Equipment

Gaz de France is now conducting negotiations with an American company for the installation of propane equipment in the municipal gas plants in Paris and 17 other French cities and for the delivery of the French company's propane requirements over a 7-year period.

French propane needs for 1945-50, according to the Office of International Trade, are estimated at 100,000 tons, of which some 70,000 will have to be imported.

Use of propane to enrich coal gas now being produced is expected to result in a considerable saving through reduced coal imports, freeing of many railroad cars now used for coal, and the need for a much smaller investment than that required for comparable coal-gas facilities.

Magnetometer Surveys Under Way Off Cuba

Eureka Petroleum Co. is conducting magnetometer surveys in the shallow waters along the north coast of Matanzas, Las Villas, and Camguey provinces, Cuba.

The company is using a recently purchased Canadian corvette, according to the Office of International Trade of the Department of Commerce. The surveys are expected to be completed within 2 years.

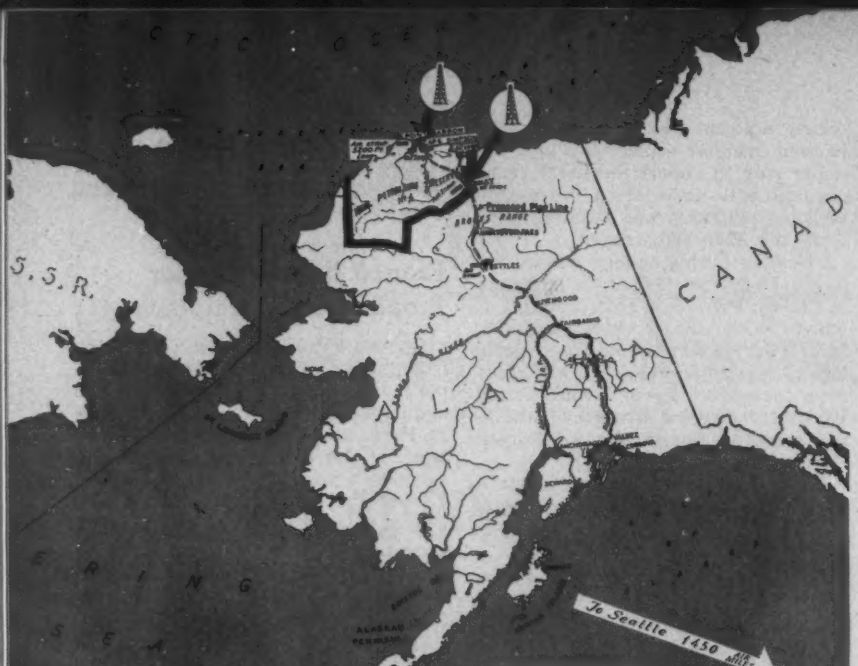
First-Quarter Mexican Crude Output Gains

Mexico's production of crude oil showed an increase of 17 per cent in the first quarter of 1947 over the same period of 1946. Total production the first 3 months of 1947 was 13,084,193 bbl. while the 1946 figure was 11,178,412 bbl.

Exports of crude and products for the 1947 period were 2,511,190 bbl., an increase of 253,885 bbl. over the 1946 period. The United States received 1,809,227 bbl., well over half of the total.

T.L.L. Increases June Output

June production of Trinidad Leaseholds, Ltd., from its own fields, showed a slight gain over May with a total of 546,283 bbl., or a daily average of 18,209 bbl. In May, the company produced 562,121,000 bbl. for a daily figure of 18,133 bbl.



Map of Alaska, showing location of active areas in Naval Petroleum Reserve No. 4, and route of the proposed pipe line

This is the first of three articles by C. O. Willson, editor of The Oil and Gas Journal, dealing with the efforts to find oil in Naval Petroleum Reserve No. 4 in northern Alaska. Willson visited the 35,000-sq. mile reserve last month and obtained first-hand information as to the status of the exploratory program now in its third year. Aside from the importance of this particular operation, Willson's descriptions of activities are of interest in giving the "know-how" of exploration in an Arctic region, including the several required supporting activities.

by C. O. Willson

Full-Scale Exploration Alaska

Under Way by Navy in Arctic

POINT BARROW, Alaska.—The search for oil in the Arctic region of Alaska within the boundaries of Naval Reserve No. 4 is passing from reconnaissance to a more detailed exploratory period. Two wildcat tests were spudded in during June—one at Cape Simpson, 80 miles southeast of the Arctic operating center, and the other at Umiat on the Colville River, 175 miles southeast of here. The first test of the reserve—1 Umiat—was completed last summer at a depth of 6,005 ft. with showings of oil at five depths. The second test is located about 5 miles east of No. 1 and is higher on an anticline structure outlined by surface geology and core drilling and confirmed with a seismograph survey.

Offsetting 2 Umiat is a core test which was drilled to a depth of 540

Front row: Comdr. P. W. Roberts, officer in charge at Fairbanks; Com. W. G. Greenman, director of Naval Petroleum Reserves. Standing: Dr. George O. Gates, geologist in charge, North Alaskan program, U. S. G. S., Walter A. English, chief technical advisor; Glen M. Ruby, Hoover, Curtice & Ruby, and Arctic Contractors, and Bart W. Gillespie, project manager, Arctic Contractors (Picture taken in field at Umiat)

ft. late last year. This test is credited with the first definite indications of commercial crude oil in Northern Alaska. Thirty barrels of oil have been bailed for testing purposes. The oil comes from a permafrost formation at around 300 ft. The crude oil is a high-gravity, sweet, naphthenic-base oil with a cold test of —20° F. A distillation test shows a wide cut of intermediate products.

The decision to drill the 1 Simpson was largely based on seismograph data and it is located in an area where the presence of oil seepage has been known for many years. It is anticipated that the drilling of these two test wells will be completed before the end of the year.

Add to these two exploratory tests the fact that four geological crews and two seismograph parties are operating within the reserve with a fifth geological crew east of the reserve and you have a condensed version of oil activity in Arctic Alaska at this time. A summary of available geological information and the unusual manner in which airborne, surface, and subsurface work has been and is being carried on will be the subject of a separate article.

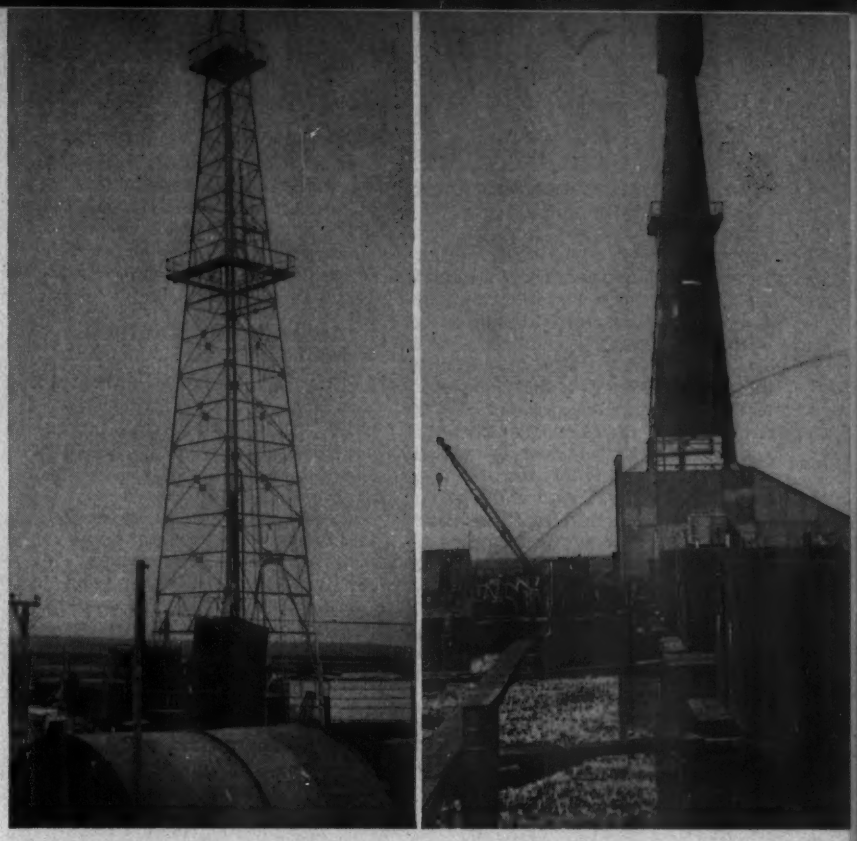
It is the purpose of this discussion to summarize the background of this program of finding oil in the Arctic region and present briefly what the Navy terms the "logistics" of the operation with its many interesting features.

Navy Objective

The objective of the present exploratory program is to determine the petroleum potentialities of the Naval reserve. There are other possible oil areas in the Arctic section of Alaska. All are public lands and they have been withdrawn from private exploration until the success or failure of the search for oil in the reserve is determined.

While no final long-range program has been announced, officials appearing before legislative committees have stated that the Navy is not planning on entering into competition with private operators with a large-scale development should major reserves be discovered in this most northern part of the Alaskan territory. Navy officials have said that they favor a program of allowing private companies to develop any reserves that are discovered under an arrangement that would be fair to the operators and at the same time assure the Navy an adequate oil reserve in an area whose military importance has greatly increased since the start of the World War II.

Should reserves ranging from 250 to 500 million barrels be found, a highway and pipe line following the route shown on the accompanying map would be practical. A preliminary survey shows that the cost of this route would not be prohibitive, with the highest point of 2,300 ft. at the Anaktuvuk Pass. At Fairbanks, the metropolis of central Alaska, where a large Army air base has been built, substantial quantities of petroleum are required. They are now brought to Fairbanks by the Alaskan Railroad from Anchorage at high costs. A pipe line from the reserve could be extended from Fairbanks to one of several convenient water shipping points on the south Alaskan coast where oil would be available in that area of the West Coast of the United States. No unsurmountable difficulties would be experienced in working out these transportation, refining, and marketing programs should large reserves of petroleum be found in northern Alaska.



Left: The 2 Umiat drilling test near Umiat camp. Right: Enclosed drilling test and part of camp at Cape Simpson

Amphibious weasel coming off landing barge at Point Barrow

Oil in the Arctic

To those who associate large petroleum reserves with the areas of high average temperatures in the United States, South America, the Middle East, and the Far East, there are two strikes against any effort to find new petroleum supplies in the polar regions. The soundness of this position has been nullified by several studies made in recent years and the indications that Russia has substantial oil reserves in its northern areas.

Wallace E. Pratt, internationally

known geologist who retired recently from his many years of executive direction of the exploration and producing operations of Humble Oil & Refining Co. and later Standard Oil Co. (New Jersey), has several times indicated his belief that important oil reserves will be found in the Arctic areas of North America. He points out that the polar ice caps are of comparatively recent origin and over the greater part of geologic time the plant and animal life generally associated with the origin of oil existed in the areas of low average temperatures.

Pratt's Statement

Writing in Harper's Magazine during the early part of the war, Pratt said:

"Up till now the United States, with an area of 2.4 million square miles in which petroleum may reasonably be expected to be present, has produced more than 60 per cent of the world's petroleum. The Far North, by comparison, includes a land area (north of the sixtieth parallel) of 1.5 million square miles which may also be described as favorable for petroleum. This comparison affords a reasonable basis on which to judge the potential petroleum sources of the Far North. They may well be half as large as our own American resources.

"Most of the land area in the North Polar region lies within the border of the Union of Soviet Socialist Republics in the Eastern Hemisphere; the most extensive exploration for petroleum in the north has been carried out by the Soviet Government. It is understandable therefore that the evidence accumulated so far indicates larger resources of petroleum in the Soviet domain than in the rest of the Far North. Soviet geologists have examined areas in Siberia aggregating 1 million square miles (north of the sixtieth parallel) which they consider favorable for the occurrence of petroleum. In the Western Hemisphere our own geologists estimate at about one-half million square miles the land area (north of the sixtieth parallel) favorable for petroleum. Notwithstanding this disparity in area some of the most important prospects, including one of the oldest active oil fields in the Far North, are to be found in the Western Hemisphere."

Naval Reserve No. 4

It should be made clear in the beginning that activities in Naval Reserve No. 4, which got under way before the end of the World War II, are in no way connected with ill-fated Canol project of 1942-45. The source of crude-oil supply for the Canol operation was Norman Wells on the MacKenzie River inland from Great Bear Lake in Canada. The only parts of the Canol project now being used are the Alaskan highway starting at Edmonton, Alberta, and ending at Fairbanks, and a section of the product-line system where shipments were reversed with deliveries from the seaport of Skagway to Whitehorse and points farther north. No deliveries are being made at Fairbanks, often termed the "gateway" in the Arctic area. In appearances before legislative appropriation committees it has been necessary for representatives of the U. S. Navy to explain in detail that Naval Reserve No. 4 stands on its own feet, with emphasis placed on the fact that the oil possibilities of Alaska's Arctic area, based on geological conditions, are much greater than those of the Norman Wells area, where a reserve generally estimated around 25 million barrels was partially developed before the Canol project was shut down.

Naval Petroleum Reserve No. 4 had its beginnings in 1923 when President Harding set aside 35,000 sq. miles, as shown on the accompanying map. His action followed preliminary exploration work by the U.S.G.S. and a private company, coupled with the fact that oil and gas seepages had been reported at scattered points by white traders and Eskimos since the purchase of Alaska from Russia by the United States in 1867. Over the next 3 years several U.S.G.S. parties during the summer months made boat and land trips covering part of the reserve and made reports on the general geology of the area. The entire area was covered by trimetrogon photography in 1943.

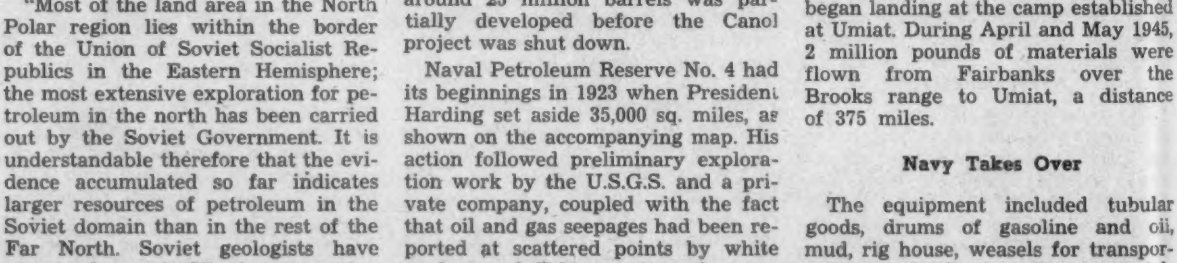
It was not until 1944 that plans were outlined to carry on an exploration program to determine whether petroleum could be made quickly available to aid in the war plans. The job was given to the Seabees by Vice Adm. Ben Moreell, chief of the Bureau of Yards and Docks for the U. S. Navy. Many of the key men who had been responsible for the outstanding accomplishments of Seabees in construction work on the Aleutian Islands and the mainland of Alaska were transferred to the Arctic theater. The work was directly in charge of Capt. Bart W. Gillespie, who, previous to the war, had been associated with petroleum activities in the United States and South American countries.

In March and April 1944, a party from Washington, D. C., visited the reserve and confirmed previous U.S. G.S. reconnaissance reports that stratigraphic and structural features of a 40,000-acre tract in the Umiat Mountain area along the Colville River were favorable for the accumulation of commercial oil. A well-defined anticline with low arch and symmetric profile had an indicated closure of 650 ft. Some surface geological work was done in the area during the summer of 1944.

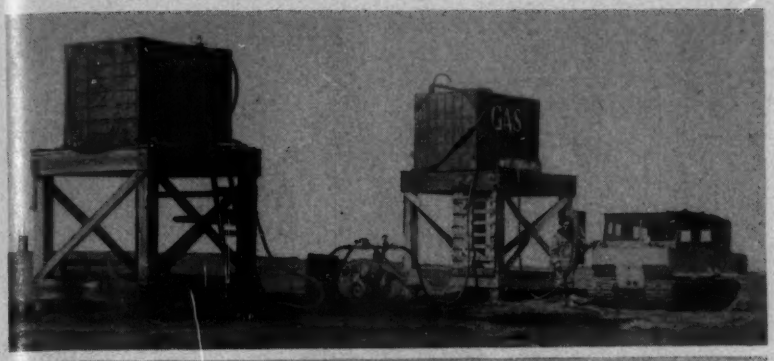
The first Navy flight from Fairbanks to Point Barrow was made in January 1945. In February planes began landing at the camp established at Umiat. During April and May 1945, 2 million pounds of materials were flown from Fairbanks over the Brooks range to Umiat, a distance of 375 miles.

Navy Takes Over

The equipment included tubular goods, drums of gasoline and oil, mud, rig house, weasels for transportation, and all the other materials required for the drilling of a 6,000-ft. test. This was one of the most difficult and hazardous operations ever undertaken in the history of the oi



Tractor train making deliveries of supplies and equipment to outlying camps during winter months



Top: Farthest north filling station at Camp Barrow camp. Bottom: Typical wanigan used by geological and geophysical parties. One shown here is provided as sleeping quarters at Umiat camp for guests

industry. It was completed without a serious accident.

Following V-J Day it became apparent that due to the return of Seabees to civilian life it would be impossible for that organization to continue the operation. It was at this time that the project was turned over to Com. W. G. Greenman, director of Naval Petroleum Reserves. Greenman was inspector of Naval oil-reserve operations in California starting in 1936. After a tour of sea duty during the war, in 1944 he was placed in charge of all Naval Reserve operations. A graduate of United States Naval Academy in 1912, Commodore Greenman has had many years of outstanding service in Naval administration work. When he was appointed to the inspector position in California he completed courses in petroleum geology and petroleum engineering at University of Southern California to better acquaint himself with petroleum operations. He takes an active interest in the work under way in Naval Reserve No. 4 which he frequently visits. Comdr. P. W. Roberts, of the Bureau of Yards and Docks, is in charge of construction for the Navy with headquarters at Fairbanks.

An appropriation of $9,600,000 was obtained to carry on the exploration work in the reserve until July 1,1950. Contracts have been entered into by the Navy covering the various activities which are an integral part of an exploration operation in the Alaskan Arctic. The main contract covering all drilling and supporting activities is with Arctic Contractors, an organization jointly owned and managed by Hoover, Curtice & Ruby, petroleum consultants and operators, and C. F. Lytle Co. and Green Construction Co., of Des Moines. These Des Moines firms were active in Alaskan construction work during the war.

The Navy also has an agreement with the United States Geological Survey by which it provides funds to the Survey to carry on geological work in the concession including the maintenance of a laboratory at Fairbanks. Arctic Contractors have contracted with United Geophysical Co. covering seismograph work. The Fairbanks laboratory is equipped to make core analyses and paleontologic and microlithologic studies and with the assistance of the Washington U.S.G.S. laboratories all surface and subsurface geological information is quickly correlated and interpreted. The firm of DeGolyer & MacNaughton, Dallas, is retained as consultants in connection with geological work of the reserve.

Another contract without which, or its equivalent, there would be no search for oil in northern Alaska is with the Wien Alaska Airlines. This organization is headed by the Wien brothers, widely known "bush pilots" who have been associated with Arctic flying for approximately 20 years. This arrangement covers a daily schedule termed the "line haul" with DC-3's from Fairbanks north to Umiat and Point Barrow. Supplementary supplies and equipment needed in the reserve operation are brought to Fairbanks by the Naval Air Transport Service from Seattle via Kodiak. From Fairbanks north practically all flying is done by the Wien Airlines In addition to the line-haul operations several smaller planes of various types adapted to the seasonal requirements are used within the reserve. All flying is done with the Wien bush pilots in accordance with CAA regulations. CAA maintains control stations at Fairbanks, Umiat, and Point Barrow.

International

Ships Due This Week

The four Navy ships and ice breaker which will bring supplies and equipment to the Arctic area of Alaska for another year are scheduled to arrive offshore at Point Barrow this week. Preparations have been completed to unload the ships quickly with barges and other landing equipment. The material to be unloaded for U. S. Naval Reserve No. 4, the Army, and local tradespeople will total approximately 50,000 tons.

The ice cap left the shores in the Point Barrow area at 1:21 p.m., July 15, and moved out into the Arctic Ocean. This enables the ships to come offshore and unload their supplies and return to the open sea through Bering Straits before the return of the ice in late August. This is an essential phase of supporting operations in carrying on petroleum exploration in Naval Petroleum Reserve No. 4.

Chemicals to Be Produced

Plans for the organization of a new British company to manufacture chemicals from petroleum and hydrocarbon gases have been announced by Anglo-Iranian Oil Co., Ltd., and the Distillers Co., Ltd., of London.

The new operations will include the expenditure of about $20,000,000 and will be developed in close connection with Anglo-Iranian's refining operations.

Oil Investments Gain

During 1946 foreign investments of the United States petroleum industry produced an income of $170,000,000, a foreign-income figure larger than that of any other American industry.

The figure was a sharp gain over 1938, when foreign petroleum investments accounted for $110,000,000, according to the Office of Business Economics of the Department of Commerce. Total income in 1946 from foreign investments of American concerns was $520,000,000.

Let's talk shop

The petroleum industry is a vital part of America . . . employs a million and a quarter of us . . . comprises over 34,000 companies engaged in research, production, refining, transportation, marketing and distribution . . . contributes to some 5,400 products that make our way of life a better one.

Despite all this we need friends. Here's why.

The average American has a hazy conception of the petroleum industry and the part it plays in the nation's economic picture . . . thinks that natural resources are being squandered . . . that new developments are being withheld from him. These ideas are dangerous; dangerous to us, to our jobs and to our future. Now is the time to correct those thoughts, to take advantage of the fact that people who know the industry well think well of it.

Each of us can help by talking shop. What we say to our families and friends will help create a better understanding of the industry's contributions to the progress of the nation.

Petroleum Is Progressive

UNIVERSAL OIL PRODUCTS COMPANY

General Offices: 310 S. MICHIGAN AVE. UOP CHICAGO 4, ILLINOIS, U. S. A.

LABORATORIES: RIVERSIDE, ILLINOIS

RESEARCH · ENGINEERING · PROCESSES · SERVICE

WASHINGTON WATCHING

BY HENRY D. RALPH

No Oil Shortage—Malone

WASHINGTON. — There is neither a short-term nor a long-term over-all shortage of oil in this country, according to a preliminary report filed by Sen. George Malone of Nevada, head of a Senate public lands subcommittee which has been investigating all natural resources.

The investigation is not yet completed and the subcommittee promises a voluminous report next session, but the chairman's sketchy interim report says there is no need to worry about oil if the industry can get the steel it needs for drilling and for pipe lines and tank cars.

Malone's report is far from a complete treatise on the oil industry. He says that the main reason for spot oil shortages this winter is "the small number of new wells drilled during the past 5 years," and that if there had been sufficient steel there would be 67,000 more wells in operation than there are at present. He adds that "if there had been more venture capital allowed to flow into the oil industry, the present situation of spot shortages would have been materially alleviated." Lack of venture capital has not even been mentioned by most spokesmen for the oil industry, but it is one of Malone's pet peeves; he has long been feuding with the Securities and Exchange Commission whose regulations of stock-selling prospectuses, he says, deny grubstakes to mineral prospectors in his state.

From the long-range viewpoint, Malone says, there is nothing to worry about because there is a reserve of 30 billion barrels of oil in the Middle East; there is enough oil shale, coal, and natural gas to produce 2,000,000 bbl. per day of synthetic crude oil for an indefinite period, which "represents a 40 per cent increase above present daily output of crude oil," and vast amounts of agricultural products and farm wastes can be converted into alcohol to substitute for gasoline and to produce synthetic rubber.

Arm's Length Gas Sales

THE Federal Power Commission has not yet put into effect the proposed rule on production and gathering of natural gas which is designed to exempt from its regulation arms'-length sales by independents, and some observers believe this rule would now be illegal in the light of the Supreme Court decision in the interstate case.

The argument is that the Supreme Court said that the intent of Congress was to have FPC regulate the price of all gas which moves into interstate commerce, beginning at the well head, and that therefore FPC has no nower to limit its own jurisdiction by what amounts to legislative action. It is also pointed out that since the Supreme Court made no distinction between arms'-length transactions and gas produced by pipe-line companies, FPC has no authority to discriminate between the two by regulating the latter and not the former.

It remains to be seen how the commission will react to this reasoning, but the argument gives weight to the contention of the natural-gas industry that new legislation, rather than an FPC rule, is the only solution. When the Rizley bill was before Congress FPC made a strong attempt to have substituted for it a short bill virtually identical with its proposed administrative rule. This bill would still be subject to the charge of discrimination against gas produced by pipe-line companies, but a congressional action of this type would be beyond challenge in the courts.

Rubber Policy Dispute

THE prospects of ample supplies of natural crude rubber at low prices have turned a majority of rubber manufacturers against the administration's plan for a permanent synthetic-rubber program, and a stiff battle is promised when the House armed services committee opens hearings this fall on preparation for legislation to be presented at the next session of Congress.

Late in the last session the Army-Navy Munitions Board drafted a plan which would more or less freeze the synthetic industry in its present form by requiring cetrain percentages of synthetic in various rubber products. Rubber manufacturers objected that this would perpetuate bureaucratic controls and saddle consumers with high-cost synthetic. They feel that no long-term program should be enacted now and that within a relatively short time some synthetics will be improved in quality and lowered in cost so that the synthetic industry can stand on its own feet without government protection.

The House committee was not pleased with the ANMB proposal, and indicated that since the rubber industry must live under the legislation it should have a substantial voice in its drafting. At the same time the committee feels that the United States must have a substantial synthetic-rubber industry and must encourage research and development of better and cheaper products. Harmonizing these two views may be a difficult task, and with the rubber industry cooling on synthetics it may be that the petroleum-butadiene producers and the Army will be the chief supporters of the proposal to require consumption of given quantities of synthetics.

Facts on Co-op Taxation

A REAL showdown on the tax-exempt status of farmer and consumer cooperative associations which engage in the oil business and other profit-making ventures is promised for next winter.

The House committee on ways and means has scheduled hearings starting November 4 on all forms of tax-exempt organizations, with co-ops under the greatest scrutiny. Spokesmen for thousands of business men, chiefly small producers and distributors, will contend that the present law permits co-ops to accumulate capital for expansion in competition with private business which must pay taxes, while farm organizations with wide political backing will argue that the co-op method simply permits members to share the profits of a mutual operation.

Co-op tax exemption has been studied somewhat by various congressional committees during the past several years, but the November hearings promise to be the first to bring out the complete facts. The Bureau of Internal Revenue has been requiring tax-exempt organizations, which include labor unions, social clubs, research organizations, and many others, to file more complete informational returns, so it now has far more data on them than in the past. Also, the congressional joint committee on internal revenue has been sending out questionnaires and collecting information.

It has been estimated that tax-exempt organizations whose primary functions are business activities are now doing some $5 billion worth of business a year, and the bulk of this is by farm cooperatives. The Treasury Department would like to get a slice of this income just as much as competitive business firms would like to see the co-ops pay it. The Treasury is assisting the ways and means committee in working out a top-to-bottom revision of the federal revenue laws for presentation to Congress

next year, so the co-op tax phase of the hearings promise to be a stiff battle.

Federal State Tax Division

AN apparent offer to abandon the federal gasoline tax if the states will agree to drop certain other taxes which the federal Government wants exclusively is made in a stiff study of overlapping taxation just released by the Treasury Department.

The report was submitted to Congress for use in a general revision of the internal-revenue laws, and while it expressly states that it contains no policy recommendations, the discussion of gasoline taxes strongly suggests that the Treasury Department is impressed with the many arguments that gasoline taxes should be left exclusively to the states. It mentions the fact that virtually every study of overlapping taxation has made this recommendation on the ground that states have been taxing gasoline for some 25 years and using the money generally for highway improvement, whereas the federal tax was imposed as an emergency measure and was intended to be temporary. In 1946 state gasoline taxes produced $900,000,000, or 18 per cent of all state revenues, while the federal tax yielded $406,000,000, or less than 1 per cent of internal-revenue collections.

The study concludes that "it may be well to explore the possibility of federal withdrawal from motor-fuel taxation in exchange for state withdrawal from another area. If timed to coincide with the over-all revision of federal excise structure anticipated for the near future, such arrangement might make a significant contribution to postwar revenue revision."

However, the study suggests that the states agree not to tax aviation gasoline but leave this to the federal Government in order to avoid impediments to interstate air commerce.

Overproduction Charged, Kansas Gas Wells Closed

WITH the backing of Gov. Frank Carlson, the Kansas Corporation Commission has ordered the shutting down of 92 wells in the Kansas portion of Hugoton gas field.

Charging excessive withdrawals of natural gas by eight companies, Jeff Robertson, commission chairman, ordered each well shut down until the overage charged against it is made up by deductions from current allowables, or until the commission authorizes further production.

Hardest hit was Republic Natural Gas Co., which was ordered to shut down 63 of its wells, which account for nearly half the company's Kansas production.

Other companies and the number of wells affected are: White Eagle Oil Co., 14; Stanolind Oil & Gas Co., 8; Kansas-Colorado Utilities Co., 2; Panhandle Eastern Pipe Line Co., in conjunction with Saturn Oil & Gas Co., 2; Cities Service Oil Co., 1; Northern Natural Gas Co., 1; and The Texas Co., 1.

The commission report said Republic had exceeded current allowables by about 5 billion cubic feet and that other companies were estimated to have exceeded allowables by a total of from 1 to 2 billion cubic feet. In Tulsa, E. F. Bullard, president of Stanolind Oil & Gas Co., declared "none of our wells" in the field has been producing because of a lack of outlet facilities. Stanolind, he said, has an interest in other wells which might have been affected.

Robertson declared that "many independent and some major companies have abided by the commission's orders." "Persistent violations of the law and regulations," he said, resulted in the drastic order. Governor Carlson said in this case he was not only supporting the commission chairman "but I insist on the action."

The order marked the first time that such an action had been taken by the Kansas commission. Before issuance of the order there were 802 wells producing in the field.

The commission chairman said that a review of commission files, court decisions, and public hearings "indicates that some companies . . . have attempted to avoid the jurisdiction of the commission and in fact have sought to nullify probation regulations designed to conserve and permit the orderly withdrawal of this natural resource."

Four days after the shut-down order, the commission announced it will conduct a hearing August 29 and advised all companies affected to appear and present any evidence as to why they should not shut down.

Crude Increases Indicate Continued Tight Market

Evidence of the tight crude-oil market is seen in two more announcements of crude price increases.

Central Pipe Line Co., which buys about 1,500 bbl. daily in East Texas field, announced a 10-cent increase retroactive to July 10, date on which Premier Refining Co. posted its increase of the same amount.

In Kevin-Sunburst field, Montana, The Texas Co. posted a gravity schedule ranging upward from $1.80 for 29° gravity and below with a 2½-cent increase for each degree of gravity to a top of 37°. Previous flat price was $1.80.

Patent for New Engine Assigned to Phillips

A patent for a new type of internal combustion engine has been issued to Carman C. Tate, of Mexico City, Mexico, and assigned to Phillips Petroleum Co. The patent is No. 2,424,723, and claims the use of various features employed both in gasoline engines and in diesel compression-ignition engines.

The new engine uses an electric spark and spark plug to ignite the fuel, and is equipped with a fuel pump analogous to the diesel engine pump. This pump injects the fuel directly into the air stream going to the cylinders, being vaporized en route after injection through a needle-type valve. Pressure is used on the fuel supply by conducting exhaust gases to the fuel tank. Fuels of lower volatility and octane rating may be employed satisfactorily, the inventor claims.

Humble Building Loading Rack to Move Crude Oil

Humble Oil & Refining Co. is reported building a 50-car loading rack at McCamey, Tex., from which to move additional West Texas crude by rail to Longview, Tex. From there the crude is scheduled to be moved to Gulf terminals by pipe line.

The loading rack is expected to permit the handling of 15,000 bbl. of crude daily. It is reported, however, that only 10,000 bbl. daily will be shipped from McCamey, supplementing a daily movement of 50,000 bbl. from Midland. *(For other details on West Texas crude shipments, see The Oil and Gas Journal, May 31, page 108.)*

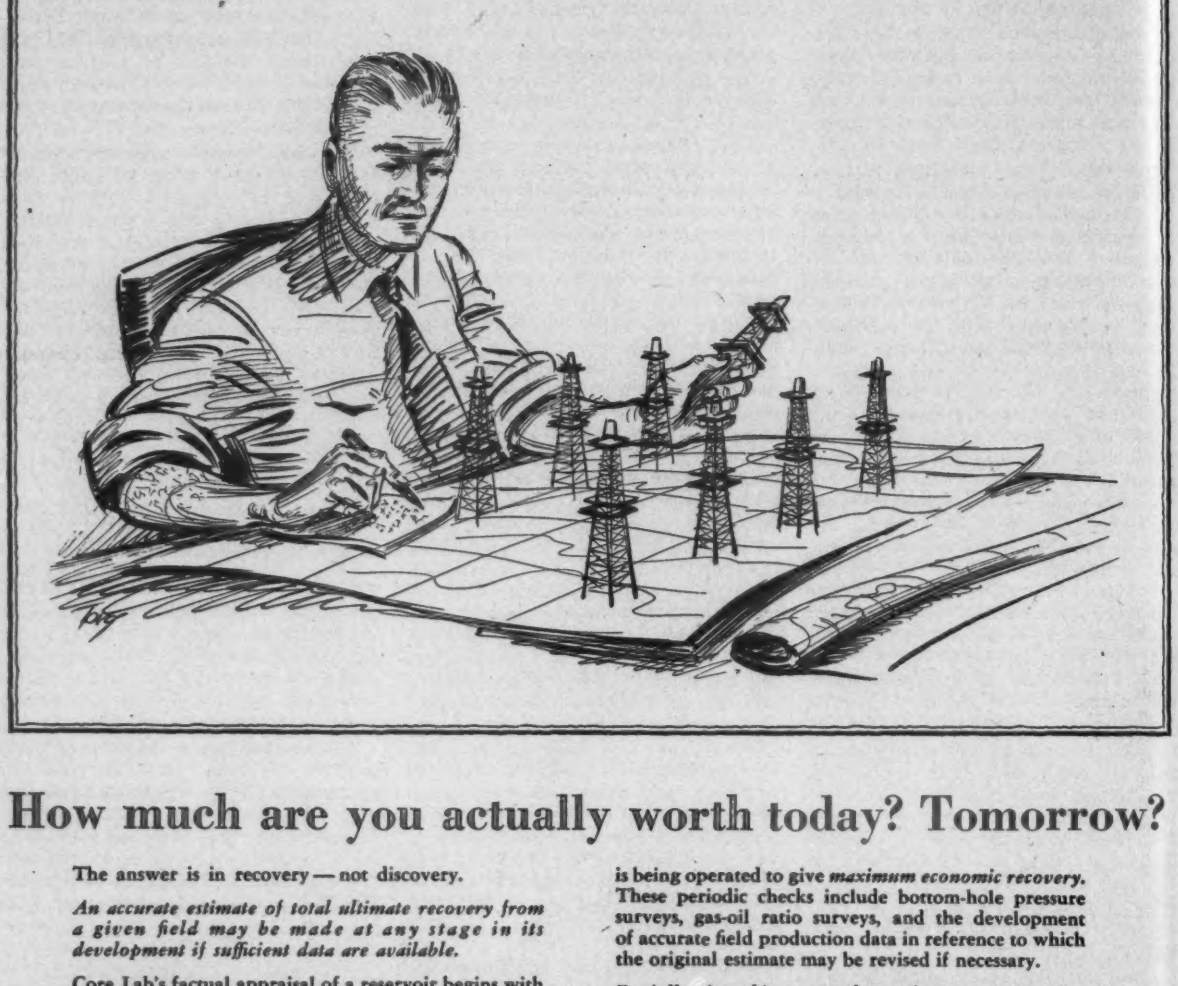
May Imports Reverse Trend, Show Decline

Opposing a strong upward trend established during the early months of 1947, petroleum imports during May fell below those of April.

Crude-oil imports, however, continue to increase, with a daily average in May of 270,000 bbl. Imports of residual oils dropped 22,700 bbl. daily during the month, with a May daily average of 163,000 bbl. For the first 5 months, however, imports showed a 30 per cent increase over the same period in 1946.

(Figures in barrels daily).

Imports by products—	May	April
Crude petroleum	270,000	262,000
Distillate	12,000	7,170
Residual	163,000	185,700
Lubricating	.....	100
Asphalt	4,000	3,870
Unfinished oils	1,000	67
Total	450,000	458,097



How much are you actually worth today? Tomorrow?

The answer is in recovery — not discovery.

An accurate estimate of total ultimate recovery from a given field may be made at any stage in its development if sufficient data are available.

Core Lab's factual appraisal of a reservoir begins with a calculation of oil content in terms of barrels of stock tank oil per acre-foot. This important piece of data is determined from the porosity, connate water saturation of the formation, and the formation volume factor of the oil itself. Pressure decline and gas-oil ratio curves may then be calculated if relative permeability and sub-surface sample analyses are available. With the above data and specific permeability, productivity index and declines in productivity of individual wells may be calculated. This procedure evaluates the expectancies from the field in its *very early life.*

Continuous checks should be made on this original estimate to make sure that all important factors have been taken into account. For example — whether or not water drive exists; whether or not the reservoir is being operated to give *maximum economic recovery.* These periodic checks include bottom-hole pressure surveys, gas-oil ratio surveys, and the development of accurate field production data in reference to which the original estimate may be revised if necessary.

By following this accepted practice an operator can know at all times where he stands financially with respect to any particular reservoir, how much he is making, how much he will make.

An increasing number of major company and independent operators and financial institutions are turning to Core Lab's comprehensive and reputable service of Petroleum Reservoir Engineering and utilizing the resulting factual and unbiased data as a basis for sound planning of current and future developments.

CORE LABORATORIES, INC. ● DALLAS 11, TEXAS

"If it's worth coring, it's worth analyzing."

CORE

Major Oil Supply From Imports Unlikely, U. S. Official Says

PROSPECTS that the United States will import a major share of its petroleum requirements are remote, even assuming that domestic production falls far below the nation's demands for liquid fuels, R. L. Trisko, of the fuels and lubricants section of the Department of Commerce's Office of International Trade, concludes in an extensive study of the import question.

United States requirements will be met by "diversification and other forms of adjustment, rather than by sole dependence upon imports," Trisko says. His 14-page analysis has been published by the Department of Commerce in an Industrial Reference Service.

If domestic petroleum production were to become inadequate, the United States would be able to meet the deficit by manufacturing a sufficient volume of liquid fuels from nonpetroleum sources, particularly coal and oil shale. Trisko examines each of these prospective sources and, in a study of economic factors, asserts that gasoline from natural-gas synthesis already is competitive with refined gasoline at current crude-oil prices. Should crude prices rise another 50 cents per barrel, he says, gasoline from coal or shale will be competitive, although its commercial development depends upon the solution of numerous technological and commercial problems.

Trisko's analysis deals with the prospects of liquid-fuel supply 20 years hence, assuming that domestic crude production drops to 1,230,000,000 bbl. annually. He discusses several various aspects of the question—foreign-oil costs, improved efficiencies in consumption, new refinery techniques as well as synthetics—emphasizing that it is by no means certain the needed petroleum will not be found in this country.

Assuming that domestic production falls to the level indicated, Trisko says, the realistic viewpoint is that synthetics as well as imports would make up the deficiency. The accompanying Table 1 was offered, not as a prediction, "but rather as a more realistic and acceptable picture of the liquid fuels and requirements of the United States in 1946."

TABLE 1—SUGGESTED SUPPLY AND REQUIREMENTS OF LIQUID FUELS IN UNITED STATES, 1965
(In millions of barrels)

Estimated requirements	2,565	
Less contraction of residual fuel oil consumption and increased efficiencies in consumption of other products	250	
Probable actual demand	2,315	
Suggested supply of liquid fuels*:		Per cent
Domestic crude oil production	1,230	53.1
Imported crude oil and products	365	15.8
Natural gasoline	100	4.3
Synthesis of natural gas	175	7.6
Shale oil and/or synthesis of coal	445	19.2
Total	2,315	100.0

*Assuming a decline in crude oil output to the level indicated; to the extent that this decline is retarded, resort to other sources will be diminished.

How Much to Import?

"The future of our domestic petroleum supply is surrounded with so many imponderables that clear-cut prediction that we will be importing half or nearly half of our requirements by 1965 is unacceptable," Trisko says in his summary and conclusions. "That there are forcible indications of an increasing need for liquid fuels from some other source, unless a reversal of the current crude petroleum discovery trend occurs, is unquestionable. However, the fact that proved and indicated petroleum reserves abroad are of sufficient magnitude eventually to supply half the anticipated requirements of the United States at economic costs, may not be construed to mean that they shall be so used.

"The decision as to how much oil shall be imported into the United States rests to a considerable degree with the major companies, who have at their disposal half the world's oil production outside the U. S. S. R. It is not likely that oil from other sources will be available for import by other firms in sufficient quantity to affect the domestic price structure. In these circumstances, the price level of the domestic liquid-fuels industry as a whole can be tied to conditions in the domestic crude petroleum industry, and investment in oil shale, or coal or gas synthesis plants, can safely be made when they are in approximately the same economic position as oil refineries operating on crude petroleum at stable prices. Both the feasibility and the probability of such a course of action is apparent from the fact that the gas synthesis plants now under construction or being planned, and the proposed coal synthesis plants, are competitive with refinery costs at present domestic crude prices, but not with prewar costs.

"From a purely business point of view, the uncertainties surrounding the conditions of production abroad may be an influential factor in deterring United States companies from relying too heavily on imports, should domestic crude oil production fall short of requirements. The fact that the circumstances of the domestic industry and the availability of other resources offer them an alternative is too significant to be overlooked. An important consideration is the fact that the apparent price advantage of foreign oils may be appreciably diminished by increased tax or royalty demands in the countries of production, by large new discoveries in the United States, or by reductions in the cost of producing synthetic liquid fuels.

"The inclination of the oil industry to turn to synthetics when it is economically sound to do so is evident. The large-scale commercial synthesis of coal awaits the solution of the technological problems of lower-cost production than now achieved by the coal industry, as well as the development of more suitable synthetic processes, and the accumulation of additional evidence that synthetic plants are not likely to be suddenly outmoded by unexpected discoveries of large new pools of crude petroleum. The lower the cost at which synthesis is placed in operation, the less effect such discoveries will have."

Limitations as to Output

Although natural gas is the most promising supplemental source of liquid fuels, it is the one with the greatest limitations as to potential output, Trisko says. He points out the greatly increasing market for natural gas and concludes our total reserves of natural gas are equivalent to about 8 billion barrels of gasoline—approximately 10 years' requirements. Also, he says, since one-third of the gas is produced from oil wells, its fate is closely associated with that of the crude-oil industry.

As supplementary sources of fuel, oil shale and coal do not have these limitations. The report says, however, it is a mistake to conclude that any one of the three supplemental sources will ever displace crude petroleum, although they are likely to become increasingly important if the domestic crude-oil industry enters a period of "permanent stabilization or decline."

The coal industry has the ability to produce coal for synthesis in addition to that produced for present uses, the report says. Excess capacity is one of the traditional economic problems of the coal industry. If a further increasing in capacity was desirable, it could be obtained by opening new mines and by increasing productivity in the mines now operating. Reserves of shale, Trisko says,

(Continued on page 149)

Legislation to Quiet Inland States In Tidelands Case May Be Sought

THE type of tidelands legislation which the administration will request of Congress next session has not been settled upon with finality, but it very likely will be a complete quitclaim of all inland waters, rivers, lakes, bays, harbors, and ocean beaches down to the low-tide mark, all as fixed by the U. S. Coast Geodetic Survey. It may also forego federal jurisdiction over the ocean between the low-tide mark and the international limit except for reservation of all mineral rights in the ocean bottom.

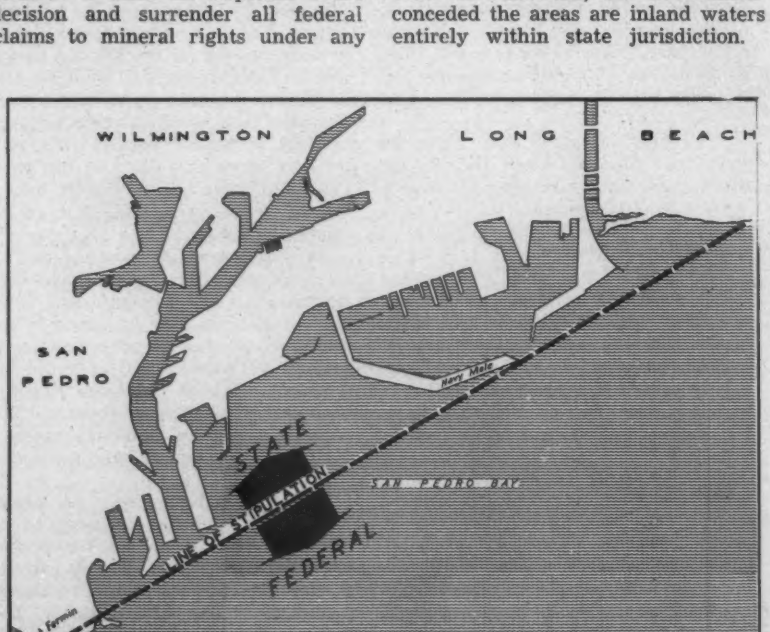
Such legislation would be designed to quiet the opposition of all inland states and also those coastal states which have no offshore oil production but have been fearful that the federal Government might claim their piers, docks, and fisheries. Only the states of California, Texas, and Louisiana at present have a direct interest in production of oil or other minerals from beneath the ocean, and their legislators would have to get support from other members of Congress simply on the basis of principle.

The coastal oil states will fight any such proposal with a counter measure to undo the Supreme Court decision and surrender all federal claims to mineral rights under any part of the sea, and while they are at it they may also ask that the states be given control of leasing on the Continental Shelf beyond the 3-mile limit on the ground that there would never be adequate exploration and development under federal control.

The California delegation in the House has appointed an unofficial steering committee to handle the legislative battle, and it is possible that subcommittees of the House and Senate judiciary committees may hold some preliminary hearings on the subject before Congress reconvenes.

Gov. Beauford Jester of Texas may seek endorsement of the state position at a meeting of the Interstate Oil Compact Commission next week in Great Falls, Mont. Texas Attorney General Daniel has accepted an invitation to discuss the issue at the annual meeting of the Independent Petroleum Association of America September 30 in Oklahoma City.

The Government already has relinquished all claim to three West Coast areas, San Francisco Bay, San Diego Bay, and a portion of San Pedro Bay. In an interim agreement between the Government and the State of California, the Government conceded the areas are inland waters entirely within state jurisdiction.



Map of San Pedro Bay, showing line of demarcation between inland waters under state control and the marginal sea under federal control, agreed to in a recent stipulation between the Government and the State of California

Optimism on Supply Marks Bureau Forecast

WASHINGTON.—The U. S. Bureau of Mines estimates the August demand for domestic crude oil will be 5,152,000 bbl. daily.

Demand rose from 4,725,000 bbl. daily in April to 4,992,000 in May and is estimated at 5,130,000 in June and 5,160,000 in July.

The forecast for August includes estimates of total gasoline demand of 18,000,000 bbl., a yield of gasoline from crude oil of 42 per cent, and total crude runs to stills of 5,130,000 bbls. daily. Crude runs to stills averaged 4,947,000 bbl. daily in May and are estimated at 5,120,000 in June and 5,150,000 in July.

The bureau said if runs can be continued at these high levels for the next few months the supply of products should meet estimated requirements and provide for the necessary seasonal increase in fuel-oil stocks, but decreases in stocks of finished gasoline indicate the need to raise gasoline yield substantially in August and September.

The actual total demand for all oils is estimated at 515,000,000 bbl. for the second quarter, or about 1 per cent above the forecast published in June, and the bureau said that from present trends total oil demand in the third quarter may exceed previous forecasts by 1 or 2 per cent.

Courses on Drilling Mud To Be Held in Midland

A 2-week course on drilling mud, for roughnecks, drillers, tool pushers, engineers, and all others in the area employed in the petroleum industry who can benefit from such training, will be held at Midland, Tex., starting August 11.

Kye Traut, formerly an engineer for Gulf Oil Corp. and now with the University of Texas, will conduct the course, which is sponsored by the American Association of Oilwell Drilling Contractors, the University of Texas, and the Texas State Board for Vocational Education.

Production Records Set By Indiana Standard

Striving to satisfy record-breaking demand for gasoline Standard Oil Co. (Ind.) and subsidiaries hit new output highs in July, officials have announced.

While final figures are not yet available, it was certain that net crude oil production from the companies' own wells exceeded 200,000 bbl. per day and that the twelve refineries boosted their crude runs to about 385,000 bbl. daily. Both figures are new records.

PERSONALS

Donnell Long Identified With Ohio Oil Leadership

PRESIDENT of Ohio Oil Co., which celebrated its sixtieth anniversary August 1, is 63-year-old Otto D. Donnell, who joined the company 41 years ago as a mechanical engineer and who has held the presidency for the past 20 years.

He has been a director for the past 37 years. His father, J. C. Donnell, was president of Ohio Oil when the present company head joined the concern in 1906.

His election to directorship came in 1910, 4 years after joining the company, and accompanied his appointment as assistant general manager, a position he held until 1927.

He was elected second vice president in 1913, serving in this capacity until his elevation to the first vice presidency in 1922. From 1922 until 1927 he served as first vice president and treasurer.

During the war he served as chairman of the petroleum industry committee for District 2, chairman of the industry production committee in the same district, and a member of the general industry committee. He also was a member of the Petroleum Industry War Council, and for several years served as treasurer of the American Petroleum Institute, of which he also was a director.

Ohio Oil Co. was founded in 1887, 2 years after the discovery of Lima field, in Ohio, by a group of producers in the sour-crude field. Shortly thereafter most of its stock was bought by Standard Oil Co., and Ohio Oil operated as a subsidiary until the dissolution of Standard under the Sherman Act in 1911.

Expansion of the smaller company, begun under Standard's control, continued after it became an independent.

With some 121 wells to start with, the company had a daily average production of about 1,500 bbl. on its first birthday, and about 4,000 bbl. on its second. Today the company produces oil from about 8,000 wells in 17 states, owns 4,000 miles of pipe lines carrying more than 120,000,000 bbl. of crude oil a year, and has 34,000 stockholders, compared with the original 14.

C. E. Braun, L. S. Fish, and **D. H. Voorhies** have been appointed assistant managers in the department on organization of Standard Oil Co. of California. Braun, with California Standard since 1914, has been an assistant to the department manager. Fish, who joined the company 26 years ago, has been in charge of organization surveys of various departments of subsidiary companies as a specialist on organization. Voorhies started with the California Standard 27 years ago and has been in the organization department since 1936 working on organization planning manpower utilization, cost control and related problems.

H. B. Steadman, chief mechanical engineer for Shell Oil Co., Inc., Tulsa office, will leave New York August 16 on a 60-day foreign leave to London.

Floyd K. Newlin, Jr., engineer for Barnsdall Oil Co., has been transferred from Tulsa headquarters to the Arkansas district with residence at Hope, Ark.

Homer J. Smith has been appointed chief geologist for Socony-Vacuum Oil Co. de Colombia. **William Roeseler** and **C. F. Fogarty,** field geologists of Socony-Vacuum, are temporarily in the Bogota office.

Leonard Krawitz has joined the staff of the Beacon Laboratories of The Texas Co. as a chemical engineer in the chemical research department. Other new employes in the laboratories are: **Kenneth E. Werner,** mechanical engineer; **George O. Dotterer, Jr.,** chemical engineer; **Richard M. Simon,** mechanical engineer; **Douglas C. Buys,** mechanical engineer; **James H. Kanzelmeyer,** chemist; **Lewis E. Parker,** chemical engineer; **Judson H. Long,** mechanical engineer; **Boyd L. Mahan,** chemical engineer; **Charles J. Merz, Jr.,** mechanical engineer; and **Oliver D. Vail,** chemist.

W. D. McElroy has been appointed manager of the research and development division of Pittsburgh Consolidation Coal Co. He will be in charge of all pilot-plant operations in the company's program of coal gasification.

Pete W. Cawthon, Jr., Tuscaloosa, Ala., has been named to receive Stanolind Oil & Gas Co.'s fellowship in petroleum engineering for the coming year at the University of Oklahoma. Cawthon will do graduate work in the study of the displacement of fluids from reservoirs.

John H. Schaefer, vice president in charge of manufacturing and transportation for Ethyl Corp., has moved his headquarters from New York to Baton Rouge, La., to supervise the company's operations there. Schaefer was named manager of manufacturing and transportation a year after joining the company 21 years ago. He has been a vice president since 1943.

James C. Martell recently joined the staff of Coastal Oil Co., Newark, N. J., as assistant to the president. He was formerly civilian chief of the petroleum-requirements section of the Navy's fuel division in Washington, D. C.

Dr. W. Nelson Axe, formerly in charge of patent work in the research department of Phillips Petroleum Co.,

W. N. AXE

S. S. PRENTISS

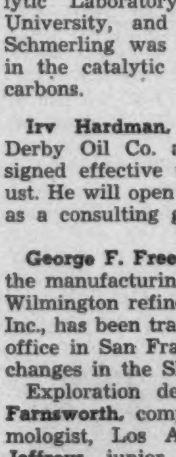
has been named supervisor of the lubricating-oil research section, and **Spencer S. Prentiss,** formerly with the Office of Scientific Research and Development engaged in government patent work, has been appointed associate director in charge of patent affairs in Phillips research department. Axe joined Phillips 8 years ago after receiving his Ph.D. degree from University of Texas.

Will H. Pattison has been placed in charge of all land and exploration activities in Kansas for Deep Rock Oil Corp. Pattison, formerly in charge of Deep Rock's land and geology of-

PERSONALS

fice in Jackson, Miss., will have his headquarters in Wichita.

Ben Uhl, paleontologist who formerly was with Richmond Petroleum Co. de Colombia, is now with Texas Petroleum Co. in Colombia.



DR. SCHMERLING

Dr. Louis Schmerling, of Universal Oil Products Co., will receive the first Ipatieff Award September 15 at the 112th national meeting of the American Chemical Society in New York. The $3,000 award, administered by the society, is given in recognition of achievements in the study of catalysis or high pressure. It was established by **Dr. Vladimir N. Ipatieff,** director of Ipatieff High-Pressure and Catalytic Laboratory at Northwestern University, and Mrs. Ipatieff. Dr. Schmerling was cited for his work in the catalytic reactions of hydrocarbons.

Irv Hardman, chief geologist of Derby Oil Co. at Wichita, has resigned effective the middle of August. He will open an office in Wichita as a consulting geologist.

George F. Freeman, technologist in the manufacturing department at the Wilmington refinery of Shell Oil Co., Inc., has been transferred to the head office in San Francisco. Other recent changes in the Shell organization:

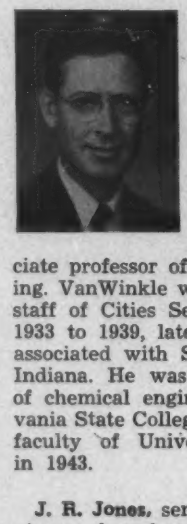
Exploration department — **Roy R. Farnsworth,** computer, to junior seismologist, Los Angeles; **Stanley R. Jeffreys,** junior geologist, San Joaquin division to the Rocky Mountain area; **Edward D. Washburn,** junior geologist, Coastal division to the Rocky Mountain area.

Production department — **Roy E. Robinson,** drilling foreman, Coastal division, to San Joaquin division; **Samuel E. Wells,** foreman, Simi station, to district foreman.

Shell Chemical Corp.—**C. P. Boutte,** chief engineering inspector, Houston, to senior engineer; **R. L. Davis,** assistant maintenance foreman to maintenance foreman, Houston; **R. E. Densmore,** junior technologist, Torrance, to technical assistant, Dominguez; **L. R. Donkle,** chemist, Torrance to Houston; **P. G. Kloos,** senior chemist, Torrance to Shell Point; **M. W. J. Oudegeest,** senior engineer, San Francisco to Shell Point; **W. G. Reynard,** department manager, Martinez to senior technologist, San Francisco; **J. F. Woicik,** junior chemist, Torrance, to Shell Point.

William C. Kinsolving, who only recently was elected president of Sun Pipe Line Co. (Texas), has also been named president of the Susquehanna Pipe Line Co., a Sun Oil Co. subsidiary. Kinsolving was in charge of constructing the Susquehanna system in 1930-31 and has served as the company's chief engineer.

E. G. Robinson, geologist for Shell Oil Co., Inc., has been named area manager of Shell's newly established headquarters in New Orleans. The new staff includes **F. W. Oudt,** exploration manager, formerly senior geophysicist at Houston; **E. N. Van Duzee,** in charge of production, formerly division manager at Lake Charles, La.; and **W. M. Johnson,** manager of the land department. The new offices in the Richards and Maritime buildings will handle a new area comprising Louisiana, Arkansas, Mississippi, Alabama, and other southeastern states.



Matthew VanWinkle, formerly on the chemical engineering faculty of the University of Michigan, has joined the department of chemical engineering of the University of Texas as associate professor of chemical engineering. VanWinkle was on the technical staff of Cities Service Oil Co. from 1933 to 1939, later a consultant and associated with Standard Oil Co. of Indiana. He was assistant professor of chemical engineering of Pennsylvania State College before joining the faculty of University of Michigan in 1943.

J. R. Jones, senior exploitation engineer, has been transferred from Houston to Midland by Shell Oil Co., Inc. Other Shell transfers and promotions in Texas-Gulf Coast area include: **W. Baillie,** assistant seismologist to seismologist, Jackson; **R. R. Brown,** mechanical engineer, Houma, to senior mechanical engineer, Lake Charles; **S. Buckstaff,** manager, exploration department, Tulsa, to senior geologist, regional exploration, Houston; **R. E.Clark,** exploitation engineer, Lake Charles, to senior exploitation engineer, Denver City; **J. F. Dillard,** junior mechanical engineer, Lake Charles to Monroe; **C. W. Fisher,** surveyor to engineer, Houston; **C. T. Helms,** gang pusher to production foreman, Hobbs; **R. M. Hippard,** exploitation engineer, Odessa to Denver City; **E. H. Judson,** exploitation engineer, Midland to Houston.

F. D. Leigh, junior mechanical engineer, New Orleans to Houston; **P. Lewis,** drilling foreman, La Pice district to Donaldsonville headquarters, St. Gabriel; **I. L. McCoy,** exploitation engineer, Kilgore to Quitman; **C. F. Martin,** junior exploitation engineer, Lake Charles to Midland; **J. M. Palmer,** exploitation engineer, Houston to Nome; **C. R. Patterson,** junior mechanical engineer, Midland to Donaldsonville; **T. W. G. Richardson,** junior mechanical engineer, Midland to Kilgore; **R. J. Thorson,** junior mechanical engineer, Houston to Denver City; **B. P. Walsh,** production foreman, Hobbs to McCamey; and **D. J. Wilson,** drilling foreman, Iowa to La Pice district.

Dick Strohmeyer, of Skelly Oil Co. geological department, has been transferred to the Wichita office.

E. L. Birmingham, formerly Kansas-Oklahoma district manager for Bay Petroleum Corp., has been promoted to manager of exploration at Denver.

Paul John has been transferred from the maintenance engineering and inspection division of the Baytown refinery of Humble Oil & Refining Co. to the maintenance and construction division as senior engineer. **George Showers** has succeeded John. **Harley S. Yawn** has been made foreman of the reclamation shop, succeeding **Doc G. Taylor,** who has retired; **E. A. Moyers** has been appointed welding department supervisor; and **J. S. Keating** has been made assistant zone supervisor in the maintenance and construction division.

Glenn M. Stearns, formerly chief engineer of the West Edmond Engineering Association, has recently joined Stanolind Oil & Gas Co. as assistant to the chief production engineer with offices in Tulsa.

Dr. Sherman A. Wengerd, geologist for Shell Oil Co., Inc., in the North Texas division office, has resigned his position effective August 1 to accept an assistant professorship in geology at the University of New Mexico.

Burton H. Krevsky has returned to the Bayonne, N. J., refinery of Tide Water Associated Oil Co. as chemist in the research department after a year's educational leave during which

he completed work on his master's degree at Brooklyn Polytechnic Institute.

John W. Inkster, division geologist for Shell Oil Co., Inc., has been promoted to area geologist and will be headquartered in Tulsa. **C. B. Pierce,** Tulsa, will succeed Inkster in the Wichita office.

R. H. Allgood, district geologist for Sunray Oil Corp. at Jackson, Miss., will be in charge, effective August 9, of the company's land and geological offices which will be moved to Shreveport, La.

R. O. Laird has replaced **J. C. Mitts** as head of the chemical-products inspection group in the equipment inspection department at the Baton Rouge refinery of Standard Oil Co. of New Jersey, Louisiana Division. Mitts was transferred to the mechanical division.

A. J. Thaman has been appointed assistant superintendent of the oil-movements division in the Baytown refinery of Humble Oil & Refining Co. In other oil-movements division changes, **D. J. Russell,** formerly coordinator of dock shipping, has been named assistant dockmaster; **M. W. Geisendorff,** shift supervisor, has been appointed acting assistant dockmaster; **Terry B. Long,** field clerk, has been named coordinator of dock shipping; and **C. R. Griffith,** pumpershipbreaker, has been made shift supervisor.

W. E. Bivens, Jr., has become the fourth member of Sun Oil Co.'s new geological staff at San Angelo, Tex., which is conducting surface work on the east side of the Permian basin. He was formerly at Sun's district office in McAllen, Tex.

John H. DeFord, formerly with Union Oil Co. of California, has joined the Midland, Tex., district office of Bay Petroleum Corp., as a geologist.

E. J. Freeman, Acme Petroleum Co., resigned August 1 to join American Mexican Petroleum Corp., in Chicago.

SHIFTS—

Conrad C. Dye, engineer, Stanolind Oil & Gas Co., Woodsboro, Tex., to Tulsa; **Thomas C. Borland,** engineer, Stanolind Oil & Gas Co., Tulsa, to Houston; **Hart C. Gleason,** engineer, British-American Oil Co., Wewoka, Okla., to Seymour, Tex.; **M. L. Morris,** superintendent, Sohio Petroleum Co., Ardmore, to Elmore City, Okla.; **B. F. Burke,** engineer, Carter Oil Co., Purcell to Pauls Valley, Okla.

Ivan M. Weaver, engineer, Stanolind Oil & Gas Co., Ellinwood, Kans., to Brookhaven, Miss.; **R. R. Turner,** engineer, Stanolind Oil & Gas Co., Loyd to Rangely, Colo.; **William W. Moore,** engineer, The Texas Co., Jackson, Miss., to Shreveport, La.; **H. L. Davis,** superintendent, Williams Brothers Corp., Flora, Ill., to Idabel, Okla.; **Raleigh R. Armand,** engineering, Barnsdall Oil Co., Shreveport, to Benton, La.; **Dana G. McCarty,** engineer, Humble Oil & Refining Co., New Orleans to Houston.

C. R. McCullough, superintendent, Phillips Petroleum Co., Phillips, Tex., to Okmulgee, Okla.; **Dana T. Whitton,** geologist, Sun Oil Co., Midland to San Angelo, Tex.; **W. M. Parson,** superintendent, Pure Oil Co., Fort Stockton, Tex., to Jal, N. M.; **J. F. McCarthy,** engineer, Humble Pipe Line Co., Corpus Christi to Alice, Tex.; **George J. McLernon, Jr.,** engineer, Sunray Oil Corp., Alice, Tex., to Tulsa; **H. E. Treichler, Jr.,** engineer, The Texas Co., Pearland to El Campo, Tex.; **Max C. Bailey,** engineer, J. S. Abercrombie Co., Old Ocean to Seabrook, Tex.

O. E. Van Meter, Jr., engineer, Magnolia Petroleum Co., Kermit to Midland, Tex.; **T. S. Green,** foreman, Republic Exploration Co., Hallettsville, Tex., to Jonesville, La.; **Charles M. Hartwell,** engineer, Cities Service Oil Co., Comfort, Tex., to Oil Hill, Kans.; **Vincent L. Quinlan, Jr.,** engineer, Magnolia Petroleum Co., Eunice, N. M., to Lake Charles, La.; **E. R. Woolfolk,** geologist, Stanolind Oil & Gas Co., Albuquerque to Aztec, N. M.; **Byron K. Webb,** engineer, General Petroleum Corp., Fresno to Taft, Calif.; **Wesley K. Rickel,** engineer, Amerada Petroleum Co., Oraibi to Chinle, Ariz.

DEATHS

F. R. Frye, 52, of Lansing, Mich., petroleum engineer of the Michigan Conservation Department since 1922, died August 4 in Ann Arbor. In addition to supervising Michigan geological surveys and drillings and promoting oil and gas exploration, Frye was chairman of the research and coordinating committee of the Interstate Oil Compact Commission and secretary of the Michigan Oil Advisory Board.

O. J. Connell, 62, Mid-Continent oil producer, died August 3 in El Dorado, Kans.

Harry W. Hobson, 64, assistant director of sales with the Du Pont Co. in the explosives department, died July 28, in Wilmington, Del.

Clarence E. Snyder, pioneer Alberta oil operator and partner in the drilling firm of Snyder & Head, died July 20 in Calgary.

Horace B. Simcox, 72, retired general superintendent for Continental Oil Co., died July 28 in Fort Worth. He retired in 1941 after 48 years of service in the oil industry.

George Franklin Hovis, 81, former producer and rig builder and inventor of the Hovis oil-well packer, died July 24, in Bradford, Pa. He retired from the oil business in 1923.

C. W. Snider, 76, banker, oil operator, and philanthropist, died July 30, in Wichita Falls, Tex. He was active in the early development of the field at Burkburnett and was secretary-treasurer of the old Texhoma Oil & Refining Co. which was purchased by Continental Oil Co.

William Riley Neal, 82, retired mining and oil man who helped develop the Ector County fields, died July 27 in Odessa, Tex.

William Bradford Willingham, Jr., 54, driller, died July 25 in Midland, Tex.

Finley Hugus, 75, retired superintendent for The Texas Co., died July 27 in Tyler, Tex.

Charles Elwood Snyder, 65, superintendent for Arkansas Gas & Fuel Oil Co., died in Humble, Tex., July 27.

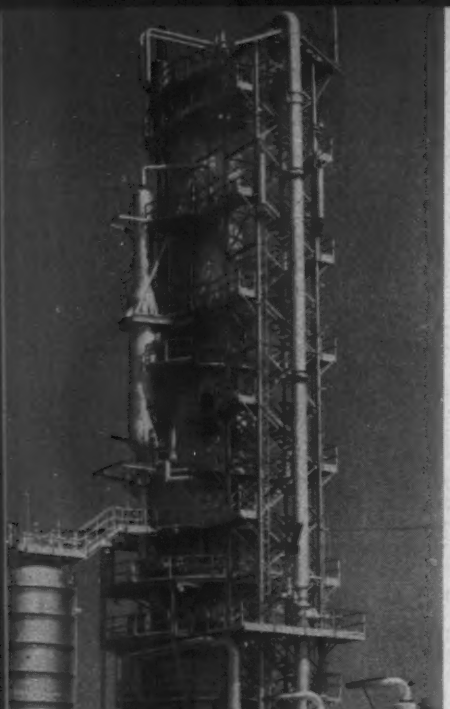
William H. Hamby, 67, retired pipeline gager of Sinclair Refining Co., died July 30 in a Dallas hospital.

W. A. Thomas, 76, retired sales representative for Fred E. Cooper, died July 30 at Broken Arrow, Okla.

Charles E. Rogers, 81, early-day oil-well driller, died July 24 in Oil City, Pa.

Bernard C. Clark, 51, consulting attorney for the Gulf Oil Corp. for 28 years, died July 25, in Pittsburgh.

Charles Preston Scott, 66, field supervisor of Carolina Texas Oil & Gas Co. for the past 22 years, died July 30 in San Antonio.



Midget CATALYTIC CRACKER

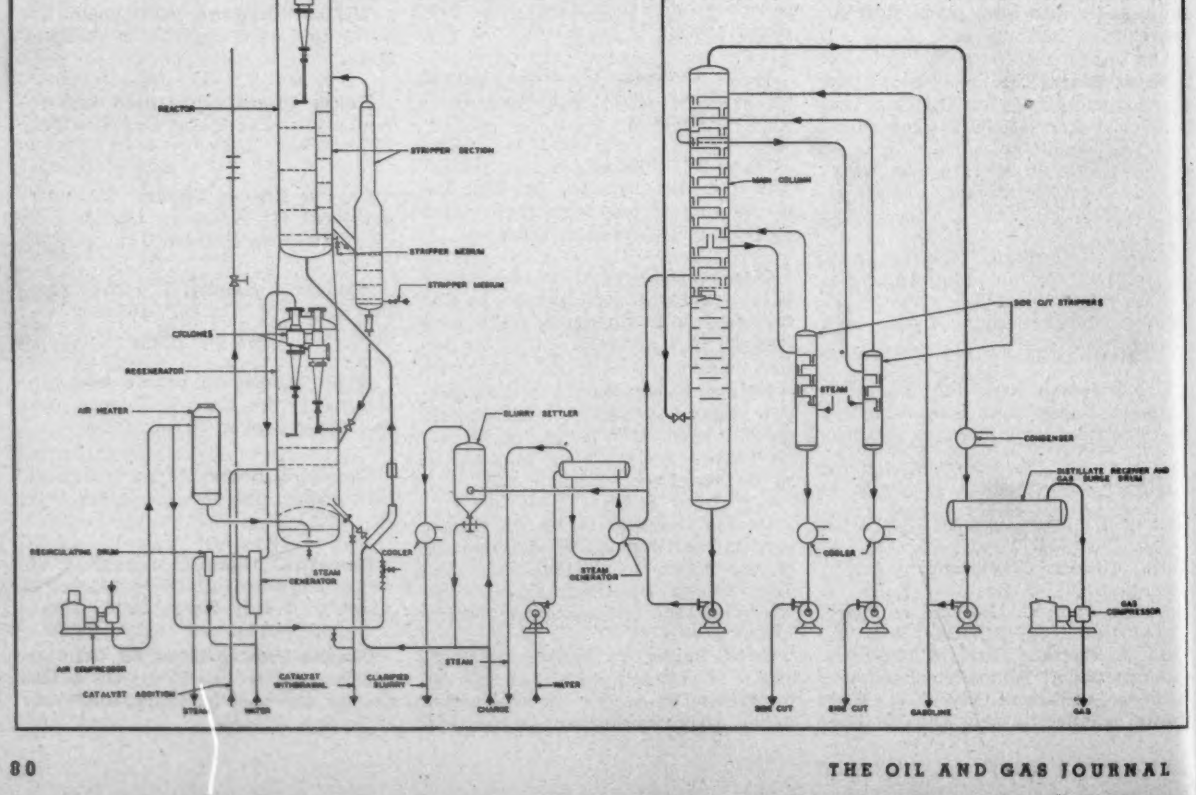
Starts Operation at Detroit

by Arch L. Foster

OPERATION of the newly completed Fluid catalytic cracking unit of Aurora Gasoline Co. of Detroit marks the passing of another milestone in the application of catalysts to oil-cracking operations. This unit is rated at 3,500-4,000 bbl. of charge per day, and will produce well above 50 per cent of that stock as motor-fuel component, along with large yields of light and heavy furnace or heating oils, and little or no heavy residual fuel oil. Results such as these bear on so many of the refiner's major problems that the introduction of catalytic cracking for the small refiner may be considered to mark the end of one era in refining and the beginning of another to rule the industry for a considerable time to come.

The new plant is smaller in capacity than any existing plants except one at Alma, Mich.; one at Cheyenne, Wyo., built during the war, and a new unit at Casper, Wyo., placed on stream just recently. The Aurora unit started operations on June 10. It is

Most of the major equipment set forth in the flow diagram, below, of the new fluid catalytic cracking unit of Aurora Gasoline Co., can be seen in the photo view at the left. The reactor and regenerator units are built into one column, 132 ft. high



Forty representative refiners were guests of Aurora Gasoline Co., Detroit, last month to observe the concern's new fluid catalytic cracking unit. The refiners previously had attended the meeting of the Western Petroleum Refiners Association at Alma, Mich. Following the inspection of the new unit the refiners were guests of Universal Oil Products Co. at a luncheon at Dearborn Inn

operating currently on Illinois gas oil to yield 40 to 45 per cent of motor fuel, about 50 per cent of light and heavyy fuel-oil fractions, and 4.5 to 5 per cent of coke (see table).

The unit was designed and engineered by Universal Oil Products Co., which is one of the licensing companies for the Fluid process. The design incorporates the newest developments in the process, it is understood, which includes the single-tower combination of reactor and regenerator on the same tower base. In assembling the unit, a major portion of the equipment, used in a thermal cracking and reforming unit operated earlier on the same site was employed. Fractionator and heat exchangers and numerous other items were taken from the older unit and included in the new, reducing materially the over-all first cost of the new unit. The most important new items of major equipment are the reactor-regenerator combination with the auxiliary catalyst-stripper tower, the waste-heat steam boiler, the air compressors, and the control board and instruments. The reactor and regenerator have been simplified greatly in comparison to the huge and involved wartime Fluid systems, to the end that operation is simpler and installation cost is reduced importantly.

Design and Reactor-Regenerator

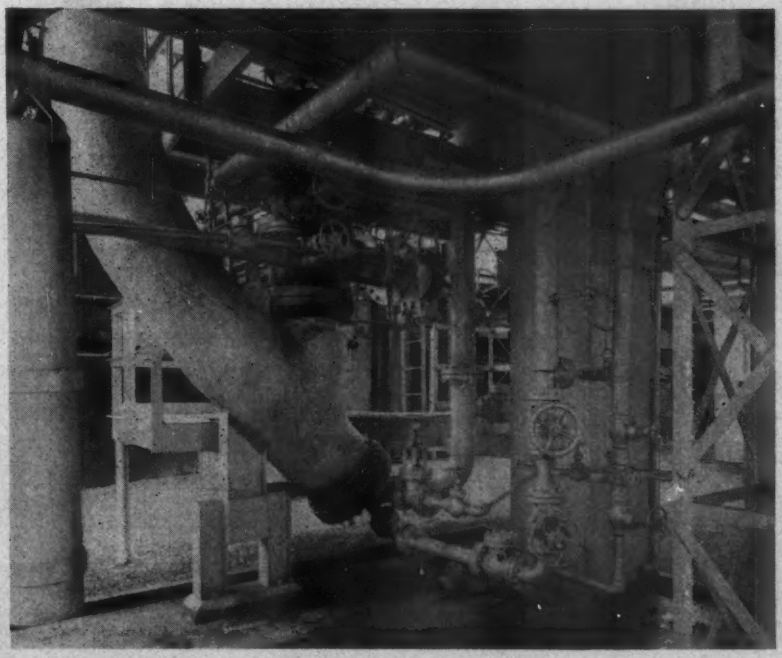
As stated above, the reactor and regenerator sections of the unit are built one column 132 ft. high, and are separated from each other except for lines conveying spent and regenerated catalyst respectively. The lower regenerator section is 16 ft. in diameter by 48½ ft. high; its top is connected to the base of the reactor by a skirt which supports the reactor. The reactor is 11½ ft. in diameter by 37 ft. high and is not lined inside. The regenerator is lined with monolithic refractory, 3 in. thick.

The most recent design of cyclone, for catching catalyst fines and removing them from the vapor stream, is installed near the top of the reactor, through which all vapor must pass before exiting to the fractionator. Two such cyclones are installed near the top of the regenerator to remove catalyst fines from the flue-gas stream before the latter exists to the waste-heat boiler alongside. This steam generator absorbs the heat from the flue gases from the combustion of the carbon deposited on the catalyst, and is in effect a heat exchanger. A tube bundle is set between opposite headers through which the flue gases pass, the tubes being filled with water. A recirculating drum is provided to return liquid water to the boiler.

A catalyst stripper is located alongside the reactor, in which the adherent hydrocarbons are stripped from the spent catalyst as it passes to the regenerator. An air heater fired by refinery gas is employed when the unit is being started. Another steam generator is provided in connection with the fractionator, in which heat in the tower bottoms is used to make more process steam. A slurry settler

(Continued on page 105)

Close-up details of the raw-oil injection point, at base of riser leading up to the reactor



Prefabricated OFFSHORE *Drilling Platform*

SETS UP IN RECORD TIME

by E. H. Short, Jr.

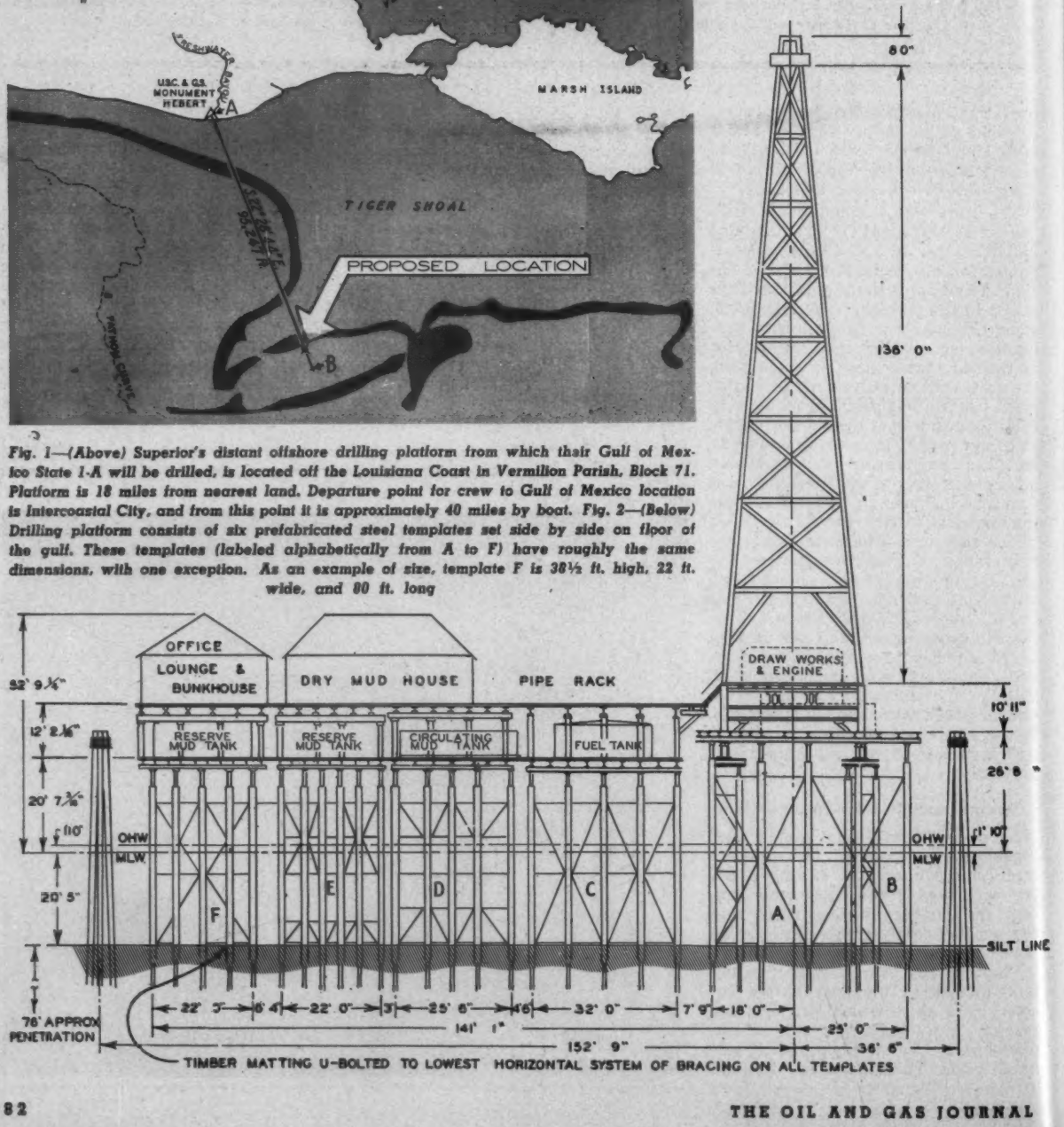


Fig. 1—(Above) Superior's distant offshore drilling platform from which their Gulf of Mexico State 1-A will be drilled, is located off the Louisiana Coast in Vermilion Parish, Block 71. Platform is 18 miles from nearest land. Departure point for crew to Gulf of Mexico location is Intercoastal City, and from this point it is approximately 40 miles by boat. Fig. 2—(Below) Drilling platform consists of six prefabricated steel templates set side by side on floor of the gulf. These templates (labeled alphabetically from A to F) have roughly the same dimensions, with one exception. As an example of size, template F is 38½ ft. high, 22 ft. wide, and 80 ft. long

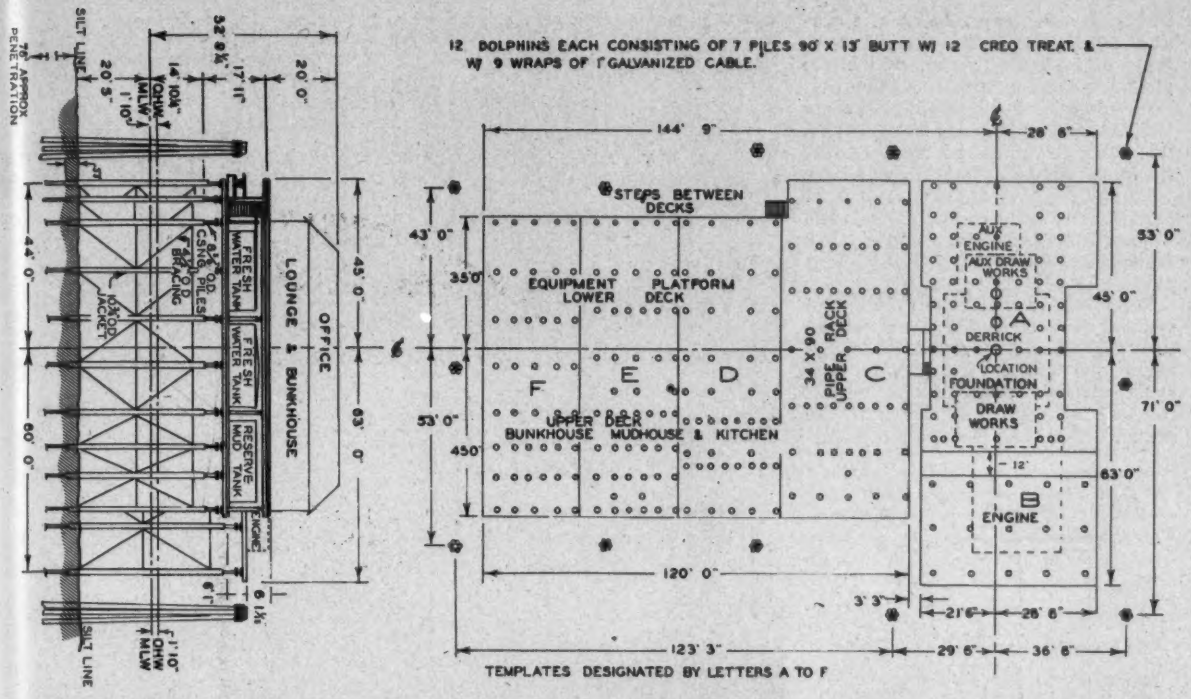


Fig. 3—Arrangement of the office, lounge, and bunkhouse on upper deck, and plan of the fresh-water and reserve mud tanks on the main deck as located on end of platform opposite drilling rig. Circles in platform plan represent jacket verticals through which piles are driven. Total length of platform is 173 ft. 3 in. Width at rig end is 108 ft., due to spacing of templates A and B. Opposite end of platform is 80 ft. wide

SUPERIOR OIL CO., among the first to extend the frontiers of workable seismic territory to distant points offshore in the Gulf of Mexico, has again taken a forward step in an important Gulf Coast development. This time it is in connection with one of the most difficult, spectacular, and hazardous drilling ventures ever attempted by the oil industry—that of drilling, far from sight of land, in the hurricane-visiting areas of the Gulf of Mexico.

Deviating sharply from the conventional piling platforms which have been used for years in close-to-shore drilling (and recently on a couple of distant offshore drilling projects) Superior Oil, in collaboration with J. Ray McDermott & Co., Inc., of Harvey, La., has succeeded in installing a prefabricated, all-steel drilling platform of tremendous strength at a point 18 miles off the shore of Louisiana.

Whereas other offshore drilling platforms of the conventional type have required months for completion, the Superior platform was in place, with piling all driven, in a period of only 9 working days. Had it not been for high winds on three of the working days the platform would have been installed in less than a week.

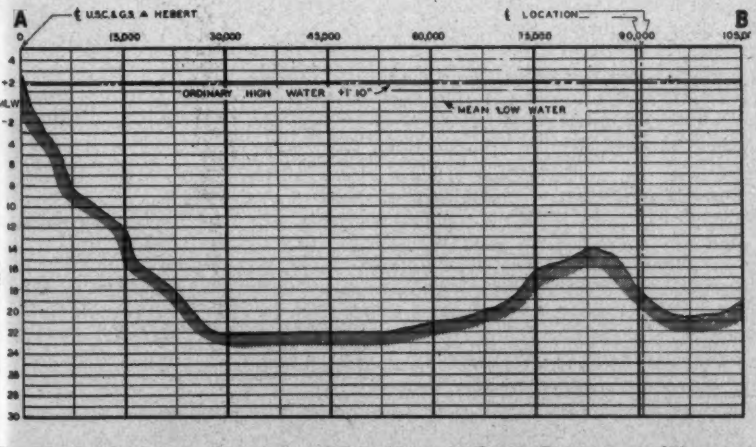


Fig. 1A—Depth of water through line A-B as shown in Fig. 1. Due to great difference in vertical and horizontal scale, chart accentuates slope, which actually is very slight. The precipitous-looking slope on which location was made has a gradient amounting to only a little over ½ in. per 100 ft.

The platform is located 95,247 ft. south, 22° 28′ 44″ east from U. S. Coast and Geodetic Survey Monument "Hebert" and 34 miles southeasterly from Intercoastal City, Vermilion Parish, Louisiana. The location, designated as Gulf of Mexico State 1-A, is spotted on the map shown in Fig. 1.

The drilling structure, or platform, consists of six templates specially designed to meet the requirements at the offshore location. These six templates are simply individual platforms. They were towed from New Orleans to location on two barges. Then the templates were lifted from the barges by crane and set on the ocean floor side by side at distances apart varying between 3 and 7.9 ft.

Dimensions of the templates vary somewhat to accommodate the various parts of a drilling-rig setup of this kind, such as the mud tanks, office, lounge and bunkhouse, engines, draw works, and derrick. Data pertaining to size and weight are shown in Table 1.

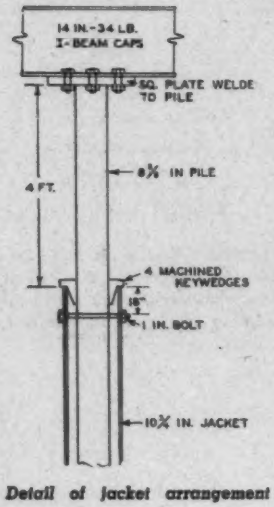
TABLE 1

	Height (ft.)	Width (ft.)	Length (ft.)	Weight (tons)
Template A	40	36	68	102
Template B	44	24	43	30
Template C	38½	32	79	75
Template D	38½	25½	78	65
Template E	38½	22	78	60
Template F	38½	22	78	60

What these templates, or structural steel frames, look like is best shown

in Fig. 7 which is a closeup of a portion of Template A. The vertical members, or jackets through which the piles are driven (after the frame has been spotted on the ocean floor) are 10¾-in. o.d. 40-45-lb. seamless steel line pipe. All piles are from 120-124 ft. long, and these were made by welding together joints of 8⅝-in. 28.55-lb. A.P.I. line pipe. The cross-bracing members were made from 4½-in. o.d. 10.79-lb. plain-end line pipe.

Referring to the center section of vertical jackets in Fig. 7, it can be seen that the piles extend somewhat above the top of the jackets. The exact distance these extend out of the jackets is 4 ft., as shown in the sketch below. The penetration of pil-



Detail of jacket arrangement

ing into the floor of the gulf varied between 75 and 80 ft.

A total of 268 8⅝-in. piles were driven through the jackets on the six templates. Fig. 3 gives a comprehensive birds-eye view of the location of the 10¾-in. jackets (indicated by small circles) in the six templates. The templates are designated by letters corresponding to those in Table 1. I-beam floor joists, fabricated on the work barges, tie the structure together.

The amazing progress of the platform installations work, which involved spotting the six templates and driving 268 piles, is best brought out by a brief presentation of the chronological notes taken on location.

June 12, 1947.—Clear, bright, calm water. First operation involved lining up derrick barge with seismic party line S 54° W, using compass. Got template A into position over location at 8 p.m. Template setting approximately in SE quadrant. Started lift at 9:45 p.m.; lights on boom; running lights on barges. No trouble. Template settled evenly, approximately 15 ft. above water—very stable. Set 10 piles ready for driving.

June 13.—Clear, hot, choppy water. At 6 a.m. finished placing all piles in template A. Moving template C into position. Started lift at 9:55 a.m. Set template down and had to reset it for correct distance from A. Template C in correct position on bottom at 10:50 a.m. approximately 1 ft. 6 in. lower than A. Started driving piles at 7:20 p.m. using Super Vulcan 50-C double-action hammer. 13,000 lb. total weight. 5,000-lb. rams—15½-in. effective drop of hammer. Set template D in place at 8:10 p.m. Drove 2 piles.

June 14.—Set templates E and F in place at 1:30 p.m. to 8 p.m. Driving piles at 2:00 p.m. Drove 50 piles.

June 15.—Drove nine piles—high wind.

June 16.—Placing pile in jackets—drove 19 piles.

June 17.—Drove 132 piles in 14 hours. This is at rate of over nine piles per hour.

June 18.—Drove 22 piles—high wind.

June 19 to 23.—Bad weather. Barges in Vermilion Bay assembling caps and floor joists.

June 24.—Drove four piles. High ground swell.

June 25.—Drove 15 piles. Installing floor joists. (Remaining 15 piles were driven several days later.)

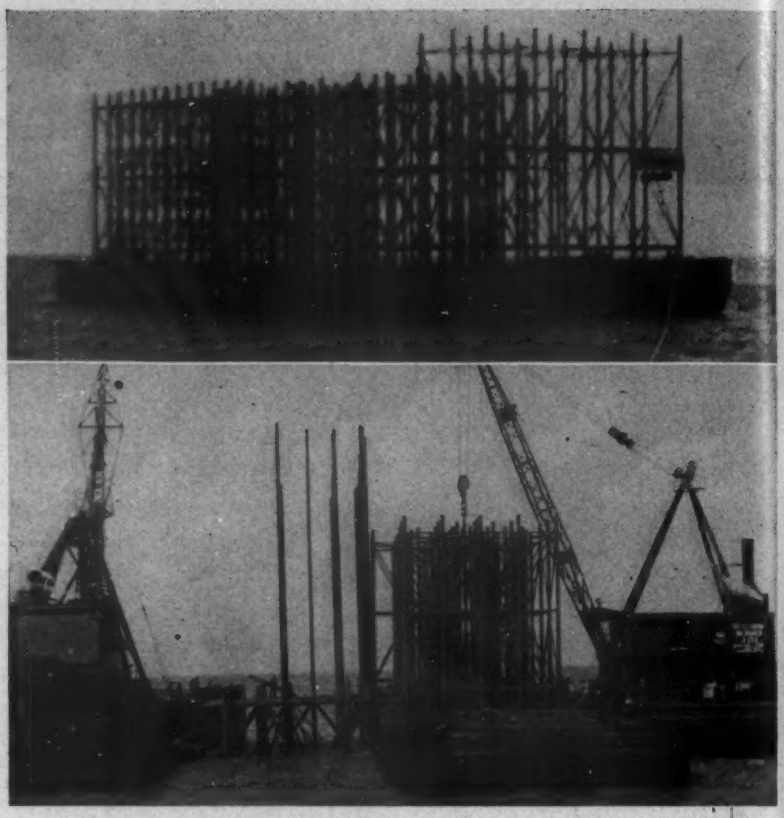
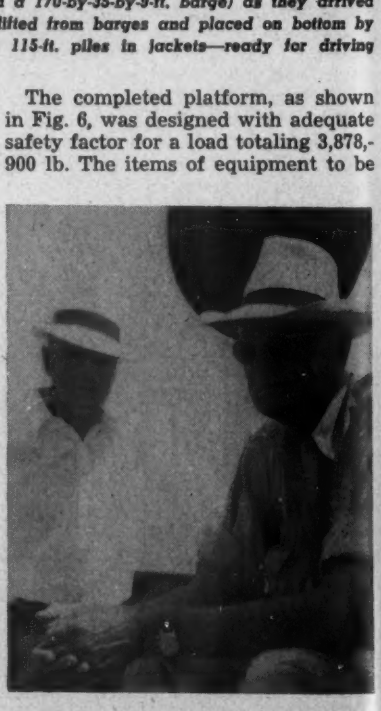


Fig. 4—(Top) The six templates were towed from New Orleans to location on two barges. This photograph shows four templates (aboard a 170-by-35-by-9-ft. barge) as they arrived on location. Fig. 5—(Bottom) Templates were lifted from barges and placed on bottom by 75-ton derricks. At left of center are shown 115-ft. piles in jackets—ready for driving

The completed platform, as shown in Fig. 6, was designed with adequate safety factor for a load totaling 3,878,900 lb. The items of equipment to be



Aboard the Superior 83 ft. crash boat: Left: J. H. McDonald, representative of J. Ray McDermott & Co., Inc. Right, is W. S. Law, general superintendent of drilling and production, of The Superior Oil Co.'s Louisiana division

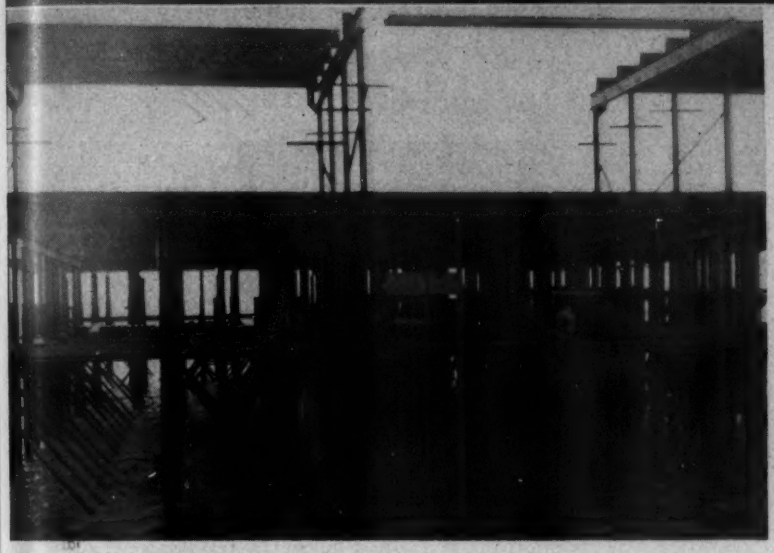


Fig. 8—(Above) The platform was set and all piles (a total of 268) driven in a period of 9 days. During 3 of the 9 days, work was slowed down by a high wind. Fig. 7—(Left) Closeup of a template section showing system of cross-bracing. Cross braces are 4½ in. o.d. xs line pipe. Vertical jackets through which piles were driven are 10¾ in. o.d. xs line pipe. All piles are 115 ft. by 8⅝ in. line pipe. Distance from water to main deck is 20 ft. 7¾ in.

installed on the platform and approximate weight of each are shown below:

MAIN DECK
Templates A and B (Rig End)

	Pounds
Derrick	87,600
Subbase	88,000
Engines and skids	98,000
Pumps	41,300
Main draw works	70,000
Standby draw works	50,000

Template C

Two 500-bbl. fuel tanks full	370,000
Two engines, four pumps	103,000

Template D

Two circulating mud tanks	310,000

Template E

Two 500-bbl. reserve mud tanks	347,500

Template F

Two reserve mud tanks (500-bbl.)	347,500
Two 500-bbl. fresh-water tanks	385,000

UPPER DECK
Template C

Pipe rack and casing—including 12,000 ft. casing and 15,000 ft. drill pipe	681,000

Templates E and D

Mud house and dry mud	525,000

Template F

Office, sleeping quarters, lounge, kitchen, dining room and pantry	375,000
Total approximate loading	3,878,900

One of Superior's 83-ft. crash boats assigned to the offshore drilling project. This boat is powered by two 600-hp. gasoline motors. Fuel is 90-octane gasoline

Drilling Rig 27 Ft. Above Water

Distance from the mean low water level to the main deck of the rig platform is 26 ft., 8⅞ in. Difference between the mean low water level and the ordinary high water level is approximately 1 ft., 10 in. The main deck of the remainder of the platform is 20 ft., 7¾ in. above the mean low water level.

Spaced completely around the structure will be 12 mooring posts. Each dolphin consists of seven creosoted piles 90 ft. long. Plans call for nine wraps of 1-in. galvanized cable at the top of the seven piles.

The Superior platform is an application of a method designed by M. B. Willey, chief engineer for J. Ray McDermott & Co., Inc. Rodger Wilson, vice president of this company, collaborated with Willey in the design.

The templates were fabricated for the McDermott company by Avondale Marine Ways, Inc., located at Westwego, La.

Specifications to fit Superior's requirements were worked out by W. S. Law, general superintendent of production and drilling of Superior's Louisiana division; Wilson, and Howard Franques, district engineer in Law's Lafayette office.

Superior's decision to use a virtually untried platform design and its subsequent successful installation of the platform in record time, represents a major step forward in the advancement of offshore development technique. It has demonstrated that prefabricated structures may be set on the bottom of the gulf without difficulty in leveling. And it has pointed the way to obtain greater

(Continued on page 91)

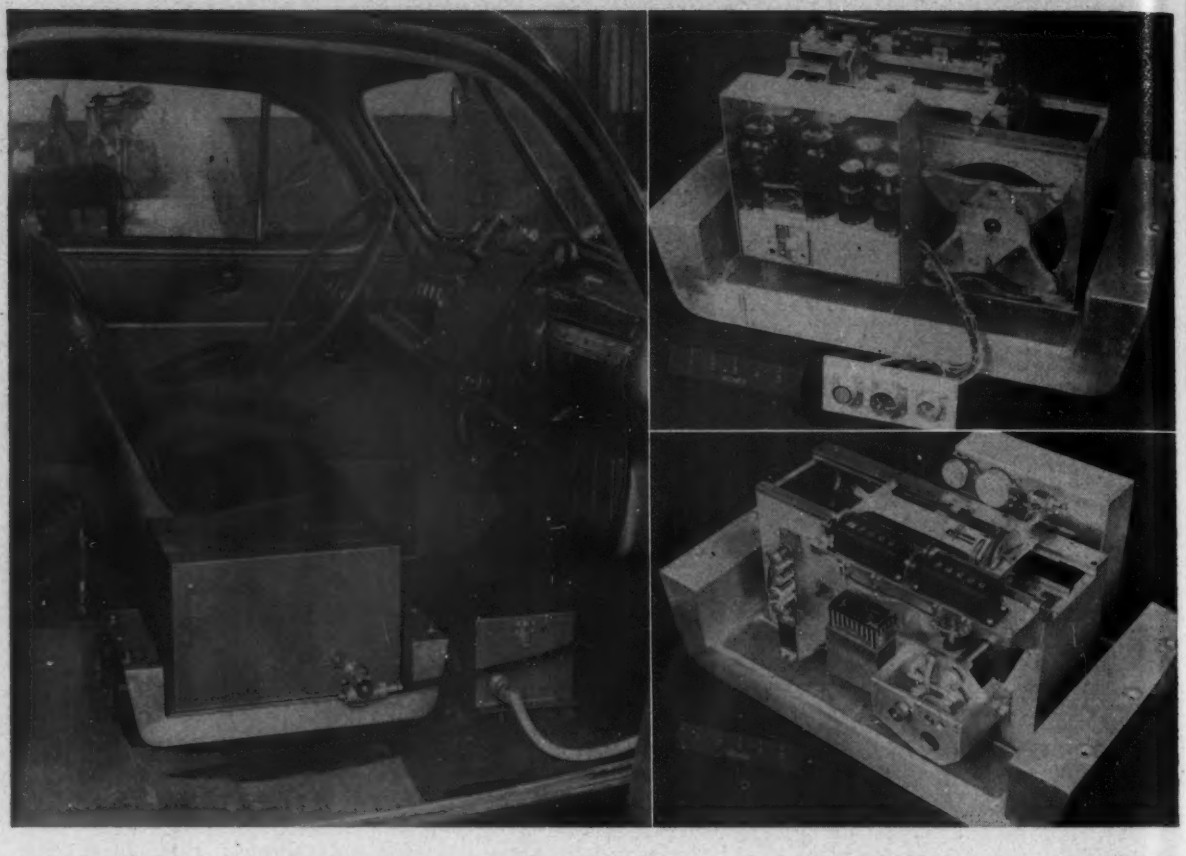
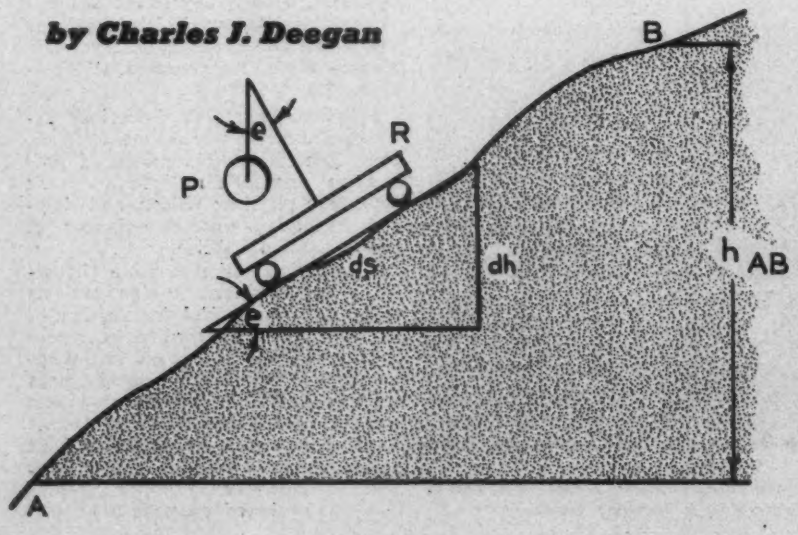


Fig. 1—(Left) Stanolind elevation meter (which measures differences in elevation with an accuracy comparable to transit or alidade work), mounted in a Ford two-door sedan. Large unit is meter; smaller unit in front of meter is power supply; behind driver's seat is manually operated siphon pump. Not shown is 8-gal. auxiliary gasoline tank under center of car. Gasoline is not consumed from rear tank while meter is operating, as variations in weight would affect level plane of car floor. Figs. 2 and 3—(Right) Elevation meter with outer cover removed. Fig. 4—(Bottom of page) Schematic diagram of a pendulum mounted on a vehicle. This is the basic principle of the Stanolind elevation meter

ACCURATE, CONTINUOUS ELEVATIONS

at automobile speeds measured by Stanolind's new surveying tool

by Charles J. Deegan



DIFFERENCES in elevation can be measured with an accuracy comparable to transit or alidade work by means of a small, compact instrument that can be mounted in an ordinary automobile, or other type of vehicle. This new elevation meter has been developed by the research department of Stanolind Oil & Gas Co.

The full field of usefulness of the instrument remains to be determined by experience and the ingenuity of engineers in many lines of work requiring terrain elevation measurements. It was originally designed to

The INTERNATIONAL TD-14
Oil Field Work Horse

● Oil field operators everywhere are enthusiastic about the rugged International TD-14 Diesel Crawler tractor. Statements like, "We're mighty proud of our TD-14's—they're highly satisfactory," and "I had no maintenance at all in two years of operation," are common.

International TD-14's are just right for oil field work. They're compact and easy to handle—ideal for slush pit work. Yet they pack plenty of power to skid derricks and spot heavy equipment.

Best of all, these tractors can be depended on to keep going hour after hour, day after day, when time on the job is of top importance. You can cut your down-time to the bone with Internationals—and that means profits in your pocket.

Let your International Industrial Power Distributor give you the facts about the International TD-14. You'll agree it's the rugged, dependable workhorse of the oil fields.

Industrial Power Division

INTERNATIONAL HARVESTER COMPANY

180 North Michigan Avenue — Chicago 1, Illinois

INTERNATIONAL *POWER*

CRAWLER AND WHEEL TRACTORS • DIESEL ENGINES • POWER UNITS

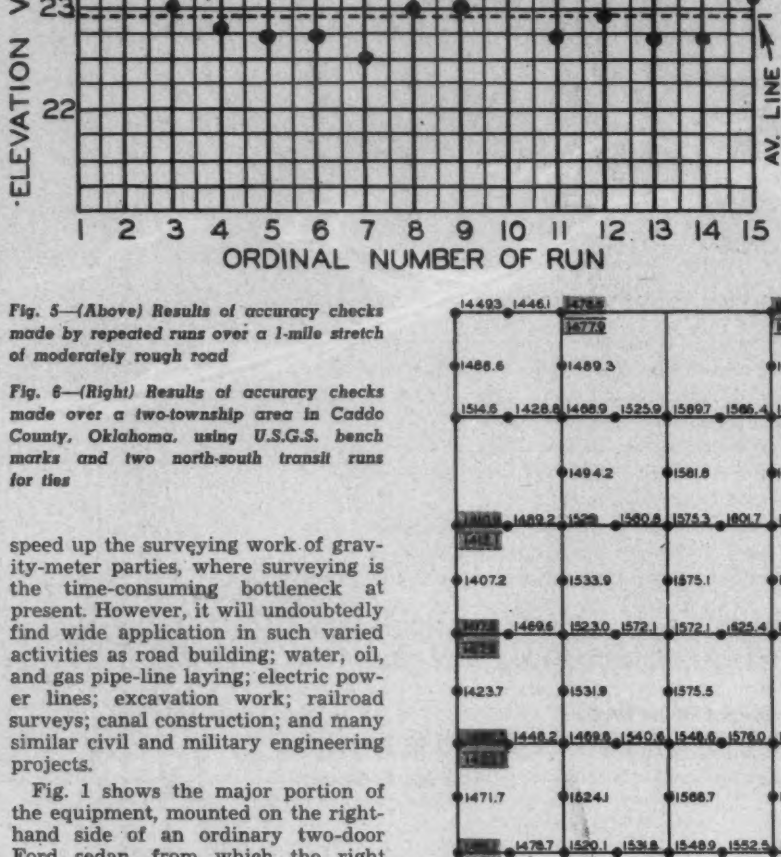


Fig. 5—(Above) Results of accuracy checks made by repeated runs over a 1-mile stretch of moderately rough road

Fig. 6—(Right) Results of accuracy checks made over a two-township area in Caddo County, Oklahoma, using U.S.G.S. bench marks and two north-south transit runs for ties

speed up the surveying work of gravity-meter parties, where surveying is the time-consuming bottleneck at present. However, it will undoubtedly find wide application in such varied activities as road building; water, oil, and gas pipe-line laying; electric power lines; excavation work; railroad surveys; canal construction; and many similar civil and military engineering projects.

Fig. 1 shows the major portion of the equipment, mounted on the right-hand side of an ordinary two-door Ford sedan, from which the right front seat has been removed. Not shown in the picture is an 8-gal. auxiliary gasoline tank mounted under the center of the car, and certain hookups to the left front wheel of the car. Figs. 2 and 3 show the instrument with cover removed. None of the added equipment interferes with the road clearance of the automobile.

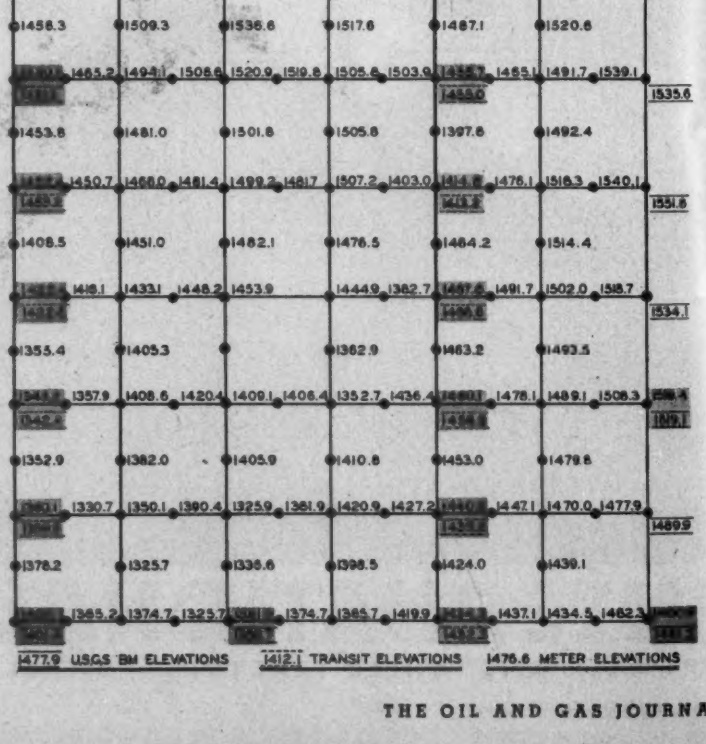
Principle Involved

The instrument operates on the pendulum principle. A pendulum will always try to point straight down, regardless of the position of its supporting framework. If the supporting framework is perpendicular to a level surface, the pendulum will hang in a line parallel with the framework. If, however, the framework is tilted at an angle to a level surface, the pendulum will swing out from the frame and assume a position perpendicular to the level surface. The angle between the penedulum and its supporting frame will be exactly equal to the angle between the frame and the level surface. (See Fig. 4.) Measuring that angle (Θ) and the distance ds is impossible. It is then a relatively simple mathematical problem to determine dh, or the difference in elevation between two points.

For more than a half century, inventors have been attempting to use this principle to devise an apparatus for determining differences in the elevations of a series of points. The reason for this search is apparent when it is realized that such a device could be mounted on a moving vehicle, and a whole series of elevation differences obtained very quickly, even continuously, at every point traversed, if desired.

Effect of Acceleration

All attempts, until very recently, were commercially impractical, be-



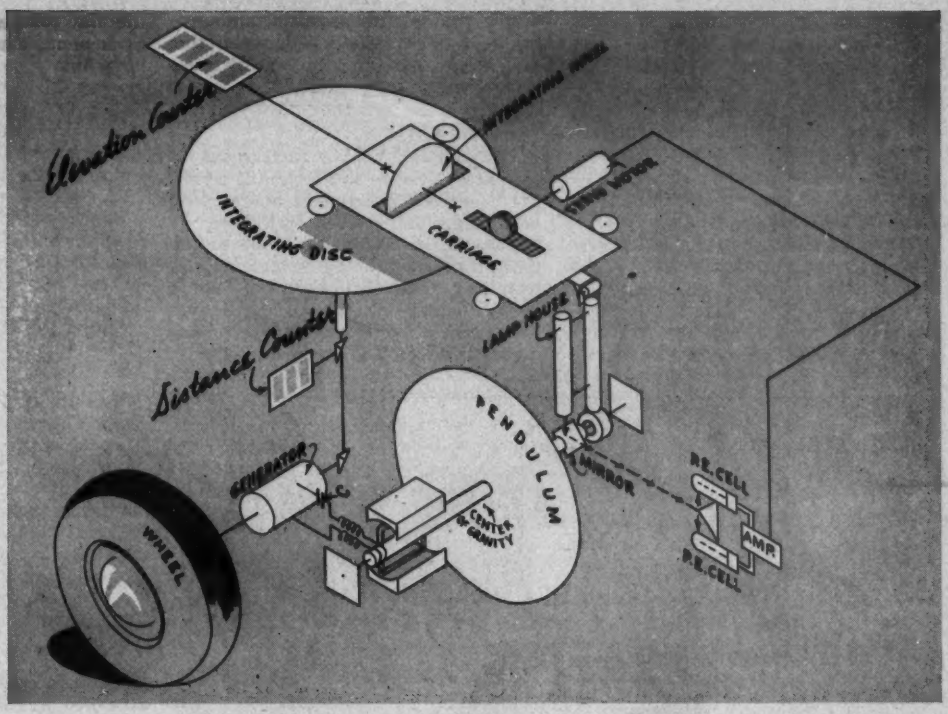


Fig. 7—Schematic diagram of Stanolind elevation meter. Lower left is wheel of vehicle to which a d.c. tachometer generator is geared for acceleration and deceleration compensation. Generator output feeds through fixed condenser to multiturn coil mounted rigidly on axis of pendulum. Coil is placed in radial magnetic field of a permanent magnet structure mounted on base of instrument. Generator voltage is proportional to velocity of vehicle, therefore current through coil and resultant torque on pendulum is proportional to acceleration.

A long-period pendulum consists of a light disk of metal, supported slightly off center, suspended by two horizontally disposed torsional fibers under tension. On axis of pendulum, a mirror is mounted. A lamp house is provided which is capable of rotation about axis of rotation of the pendulum. Light from lamp house is projected radially inward, reflected from the mirror onto stationary prism, which splits light between two stationary photocells.

Photocell outputs feed through amplifier to reversible servo motor. Servo motor drives light source through rack and pinion arrangement so that translation of rack is proportional to sine of angle of tilt of pendulum. Rotation of motor also positions an integrating wheel whose plane is perpendicular both to the plane of, and to the diameter of a rotatable integrating disk.

This integrating disk is driven proportional to distance traversed, and since position of the integrating wheel with respect to the center of the integrating disk is proportional to the sine of the angle tilt, the output of the wheel is proportional to the integral of the size of tilt angle times the incremental distance.

cause of one simple thing. Any moving vehicle will encounter conditions which require changes in speed, i.e., either acceleration or deceleration. But such acceleration or deceleration of the vehicle will also affect the free-swinging pendulum carried. At such times the pendulum will swing, not only in accordance with the change in slope of the floor of the vehicle resulting from going uphill or down, but it will also swing in response to the force of acceleration or deceleration.

The simplest way to visualize the effect of acceleration or deceleration on the pendulum is to think of sitting in a railroad dining car, holding a fairly full cup of coffee. If the train maintains a uniform rate of speed over a fairly smooth track, the coffee will not spill. But, if the engineer suddenly speeds up, or suddenly applies the brakes, the coffee tries to leave the cup, usually with success.

The coffee in the cup is exactly analogous to the pendulum mounted in a moving vehicle. Acceleration or deceleration can be powerful forces, completely upsetting the pendulum's angular measurement, from which the change in elevation is derived.

Research men of Stanolind succeeded, where inventors of the previous half century failed, because they developed an electromechanical compensator that measures the force of acceleration or deceleration. Then a force equal to the effect of this acceleration or deceleration on the pendulum is instantly applied to the pendulum, but in exactly the opposite direction. This cancels out any tendency on the part of the pendulum to respond to the acceleration or deceleration of the vehicle. Achievement of that result makes the pendulum principle practical on an instrument designed to be mounted in a fast-moving vehicle.

Field Operating Conditions

In field operations, using this instrument, only one major limitation is imposed upon the driver of the vehicle. He must avoid doing anything that will cause the wheels to slip, such as suddenly applying brakes on slippery or graveled roads. Wheel slippage will inject an error into calculations of both distance and elevation.

Other than wheel slippage, the general operation of the vehicle is left to the driver's discretion. The vehicle may be stopped and started as many times as desired during the course of a survey. The elevation meter will operate efficiently anywhere that the vehicle can travel, including cross-country driving in a car.

It is designed to be mounted in a standard make of passenger car, and to handle instantaneous or continuous slopes up to 40 per cent, (or 2,100 ft. per mile). However, if desired, the slope-handling capacity can easily be increased or reduced. The instrument is equipped with a warning system which gives notice of improper operation. Although designed for a passenger automobile, the elevation meter can be adapted for use in almost any type of vehicle. Quite a few people have suggested that if it could be successfully joined with the vehicle-borne Odograph used by the Army for mapping a plane surface, the result would be a complete mobile surveying unit.

Accuracy Checks

Over a moderately rough 1-mile stretch of road, the instrument has repeated itself in numerous trials with an average variation of about 0.3 ft. from its own mean, and with a maximum spread of values of about 1 ft. (See Fig. 5.)

Fig. 6 shows results of a fairly large-scale survey check. The work covered two complete townships in Caddo County, Oklahoma, and the results were later used for correcting gravity values.

Beginning along a line of U.S.G.S. bench marks on the east side of the township, the survey progressed in a general northwesterly direction. Elevation stations were established at ½-mile intervals around each section. At the completion of the survey, two north-south transit lines were run to serve as a check on the elevation meter's performance.

The elevation meter data were tied into a line of U.S.G.S. bench marks running on the north edge of the prospect. The largest error between the meter and the U.S.G.S. bench mark occurred at the northwest corner of the prospect, amounting to —1.3 ft. Mis-ties between the meter elevations and the transit lines were somewhat greater, the largest being +1.9 ft. on the south edge of the prospect.

Description of the Instrument

In more precise and technical terms, the Stanolind instrument operates on the slope integration principle, in which the instantaneous slope of the path traveled by the vehicle is determined from the angle between a perpendicular to the bed of the vehicle and a perpendicular to a flat plane surface. The perpendicular to the flat plane surface is determined by a pendulum so mounted in a vehicle that the arc of its swing is in the direction the vehicle is moving.

Fig. 4 shows that the angle between the pendulum "P" and a perpendicular to the vehicle bed "H" is equal to the angle between the tangent line to the path and the horizontal. Assuming that the vehicle bed is parallel at all times to the line representing the instantaneous slope of the path, the incremental elevation **dh** between two points **ds** apart is equal to:

$$dh = \sin \Theta \, ds \qquad (1)$$

where Θ is the angle between the path slope and the horizontal.

If the angle Θ varies from point to point along the traversed path **AB**, the summation of products of sines of instantaneous angles and incremental distances traversed gives the elevation difference between the two points along a traverse, thus:

$$H_{AB} = \int_A^B \sin \Theta \, ds \qquad (2)$$

Data for the determination of the distance are obtained from the left front wheel of the vehicle, while the integration process is achieved by using a Kelvin disk and wheel, with the disk being rotated proportionally to the distance traveled by the vehicle, and the position of the wheel relative to the center of the disk is kept proportional to sine Θ. (See Fig. 7.)

The power necessary to position the wheel proportional to sine Θ is obtained from a servo mechanism which gets its information from the pendulum by photoelectric means.

The electromechanical torque necessary to compensate for an acceleration or deceleration effect on the pendulum is obtained from a generator geared to the left front wheel of the vehicle. The voltage generated is proportional to the velocity of the vehicle:

$$e = k_1 \frac{ds}{dt} \qquad (3)$$

where e = voltage; s = distance traveled; k_1 = constant; t = time.

By a process of electrical differentiation, a current i is obtained, which is approximately proportional to the derivative of this voltage and therefore to the acceleration of the vehicle:

$$i = k_2 \frac{de}{dt} = k_3 \frac{d^2s}{dt^2} \qquad (4)$$

where k_2 and k_3 are constants.

When this current is passed through a coil mounted on the pendulum shaft, and capable of rotation in a uniform magnetic field, a torque is created in the coil proportional to the current and therefore proportional to the acceleration of the vehicle:

Look AT THE SAVINGS YOU MAKE with HUBER PARAFFIN SCRAPERS

	WELL No. 1		WELL No. 2	
	Year Before Install.	Year After Install.	Year Before Install.	Year After Install
Paraffin Expense	$1347.00	—0—	$ 767	—0—
Bbls. Oil Prod.	9859	9046	9978	8502
Paraffin Cost per Bbl.	$ .137	—0—	$ .077	—0—
Expense Reduction First Yr's Operation	$1347		$ 767	
Installation Cost	401		401	
NET SAVING	$ 946		$ 366	

Here are the savings made by a major company in one year with Huber Scrapers in two of their pumping wells. Well No. 1 saved more than twice the cost of the Scrapers . . . Well No. 2 saved about 90% of their cost. By preventing paraffin accumulation with Huber Scrapers, this company completely eliminated all paraffin removal expense.

It will pay you to install Huber Scrapers in your pumping wells where paraffin is accumulating. Have them installed now, and put an end to costly paraffin trouble.

ORDER FROM YOUR SUPPLY STORE

HUBER

J. M. HUBER CORPORATION

BOX 831 BORGER, TEXAS

$$\text{Torque} = -k_4 \frac{d^2s}{dt^2} \qquad (5)$$

The minus sign indicates that this torque acts on the pendulum in the opposite direction to the torque resulting from the vehicle's acceleration.

Indicating Measurements

The rotations of the integrating wheel are proportional to the elevation between points along the path traveled by the vehicle. There are various methods by which this information, as well as the distance traversed, can be translated into visual data for the surveyor.

In the instrument shown in Figs. 1, 2, and 3, the data are transferred to two revolution counters which are mounted on top of the instrument, and read through slots in the outer covering case. One counter registers distance, the other elevations.

Another method makes use of a printing device to print readings of both distance and elevation. This gives elevation and distance at discrete points along the path, and is satisfactory for many applications. It is also possible to plot an elevation profile as a function of the ground distance, or as a function of the horizontal component of the distance traveled by the vehicle.

Prefabricated Offshore Drilling Platform

(Continued from page 85)

platform strength than possible with the type of piling platforms built in the past for close-to-shore and inland bay drilling. The old type platforms were braced above the water and proved substantial enough only because of the relatively short distance between the above-water bracing to the water bottoms of the shallow areas. However, the lateral stability of a platform decreases as the distance from the bracing to the water bottom increases. Therefore, the prefabricated templates, crossbraced from top to bottom as used by Superior, offer a platform of much greater rigidity than could be obtained under the old method, and fits the requirement of strength imposed by the deep waters where drilling operations are now in progress.

Since Superior has demonstrated the practicability of setting prefabricated structures on the floor of the gulf, it is possible that it has also pointed the way toward the development of offshore drilling platforms prefabricated to even greater degrees. The fact that only 9 days were required to set the templates and drive piling on the platform indicates that it is far more satisfactory to do the maximum amount of fabricating work in the protected confines of a shipyard, than out in the open gulf.

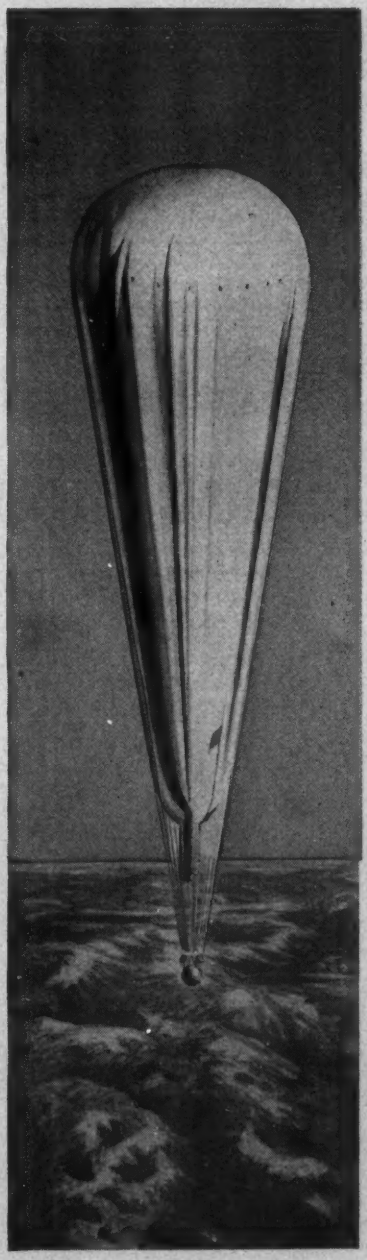
Any further possible decrease in the time required for the installation of offshore drilling platforms is highly desirable, since it will further reduce the hazards connected with open sea work of this kind. For drilling in depths of water greater than 21 ft., the possibilities of a floating platform (which could be sunk with weighted fluid to impart stability) of the proper metacentric design become more apparent. The mobile advantage of such a structure has attractive economic advantages, since, despite the best of geophysical data, the exact location of salt domes often require somewhat of a drilling search.

300 Expected to Attend Autumn A.I.M.E. Meeting

More than 300 members are expected to attend the autumn meeting of the Petroleum Division of the American Institute of Mining and Metallurgical Engineers, to be held in Tulsa October 8-10.

Technical program for the meeting, being prepared by A.I.M.E. headquarters, will include presentation of between 12 and 15 papers during five technical sessions.

P. P. Manion, Jr., is chairman of the committee in charge of arrangements of the Mid-Continent section, members of which will be hosts.



What's The Limit?

In the world's largest balloon, *Explorer II*, Captain Albert W. Stevens reached an altitude of 72,395 feet, the highest man has ascended into the stratosphere. How high can man soar above the earth's surface? What's the limit?

IS *Porous Chrome* THE ENGINE LIFE PISTON RING?

We can't be sure, *yet*. But from the performance of millions of rings now in service on gasoline and diesel engines, it's not unlikely!

KOPPERS POROUS CHROME* multiplies piston ring life by four—*even five!* The gentle honing action of these rings causes the entire set to seat within the first hour of operation, eliminating the costly and destructive break-in period, cutting cylinder wear *in half!*

These amazing piston rings are produced for all types of gasoline and diesel engines. Specify them on new equipment. Use them on overhauls. For more specific details on your motor, address Koppers Company, Inc., Piston Ring Division, Box 626, Baltimore 3, Maryland.

*[VAN DER HORST PROCESS]

K KOPPERS

American Hammered Piston Rings

IN EVERY SIZE—OF EVERY TYPE—FOR EVERY SERVICE

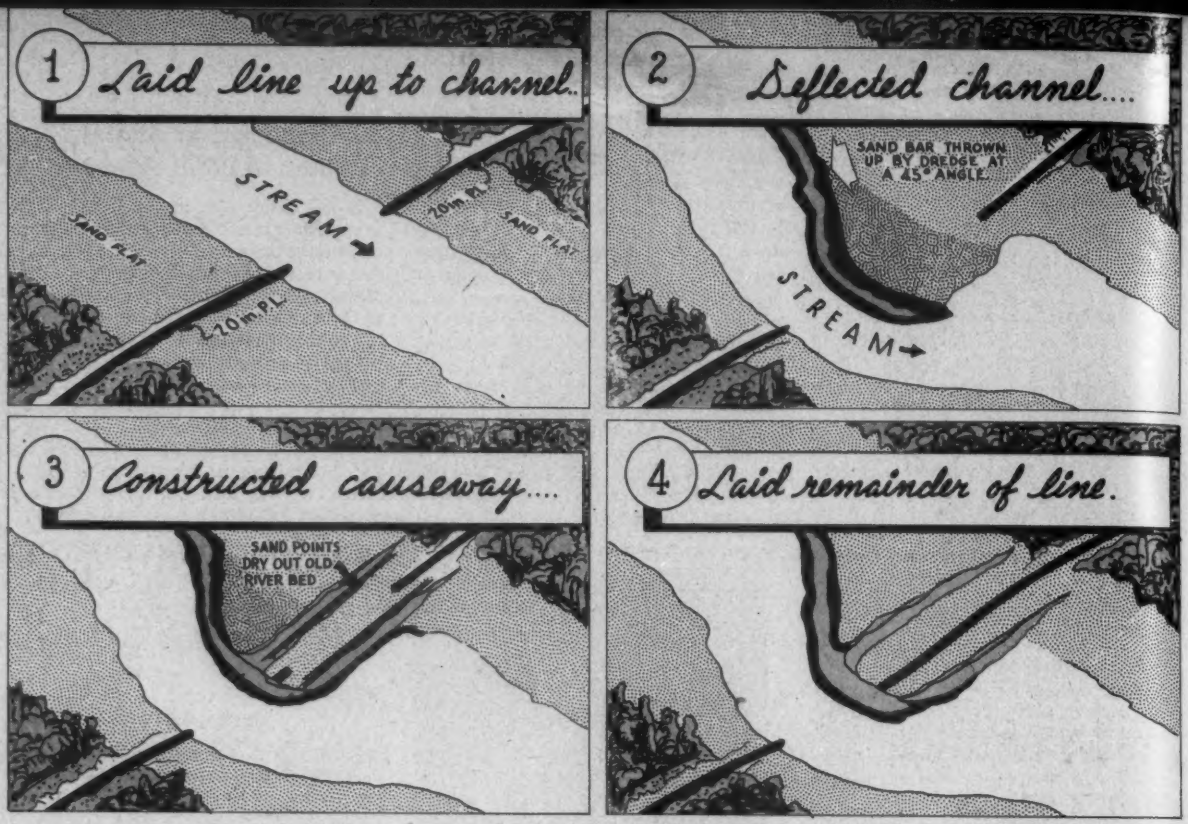


Diagram of method used to divert the course of flow of the Arkansas River by means of a temporary sand bar thrown up by a dredge, so that the stream flowed through a bypass channel

Stanolind Line Crosses Arkansas River 12 Ft. Below Stream Bed

by Paul Reed

IN construction of 178 miles of 20-in. looping for Stanolind Pipe Line Co. between Drumright, Okla., and Freeman, Mo., there have been several features representing notable developments in methods and equipment for modern pipe-line undertakings.

Temporary sand causeway. While the trench is being dug by drag line, water is pumped from the trench into the river by dewatering operation of well-point equipment

At the Arkansas River crossing for this project near Cleveland, Okla., the company laid pipe at a depth of 12 ft. which is believed to be deeper than any line has been buried in the bed of this stream. Operations connected with trenching to such a depth demonstrated that dewatering could be accomplished successfully while the work was in progress where water flowed through the sandy "percolating" stream bed in the large volumes which are characteristic of this river.

This crossing was laid in 46 days as part of the 44.94-mile section contracted by Midwestern Constructors, Inc. Five hours after completing the last weld and removing all equipment, it happened that the level of the water rose 7 ft., washing away all sand dikes which had been thrown up by a dredge in order to divert the stream during pipe-laying operations. The river is 1,500 ft. wide during high water but during a low-water period like that when the crossing was laid, the stream is approximately 800 ft. wide with a depth of 3 or 4 ft. of swift water.

The mile of line for this river

crossing section was built of 20-in. o.d. pipe with ½-in. wall thickness; this was yard coated with Somastic.

On both sides of the river, 20-in. pipe was laid up to the edge of the actual stream of water flowing when the pipe was being laid.

In traversing sand flats approaching the stream, trenching was done by drag line. The well-point method was used for dewatering. Meanwhile a dredge threw up a sand bar from the left bank extending across the river at an angle downstream of 45°. This bar when completed, diverted the river to a "U"-shaped bypass channel dug by dredge in the sand flat on the Cleveland side of the river. This U-shaped channel diverted the river over the 20-in. already laid and back into the river a short way downstream. A wide temporary dike or causeway of sand was thrown up by drag line (across the previous stream course) along the route of the remaining section of pipe to be laid for completing the installation of pipe for the river crossing. Dewatering, trenching, and pipe laying operations were carried on to completion along this temporary causeway.

C. C. Bledsoe, Midwestern Constructors, Inc., watches dredge build sand bar across Arkansas River to divert course of the stream

Dragline digging trench and the piping of well-point equipment for dewatering

A special type of sheet-metal shelter was used to protect welders against wind blown sand; these could be manipulated readily by drag lines, etc.

On the overland pipe-laying operations for this 20-in. looping, modern line-up clamps and dope kettles were used for more efficient construction.

An important departure from previous dope-kettle practice is accomplished by the recently developed C.-R.-C. thermostatically controlled, insulated unit equipped with a motor-driven mechanical agitator. With this it is possible to control temperature within a range of 2°. Temperature is observed with a visual thermometer. In operating this unit, light ends of coating material being heated are not lost. As a result of this saving, experience in the field indicates that the new unit makes it possible to increase the coating coverage so that more coating is applied to the line from a given amount of coating material.

Substantial savings are also effected due to the procedure which the new heating unit makes possible to reduce labor for operating and for handling coating material.

With this type of unit the practice followed is to avoid stringing dope material along the right-of-way at points where it will be fed into a kettle.

Loading of the heating unit is generally done at a rail head where special breaking-and-loading platform equipment is temporarily installed. It is expected that 90 per cent of the loading of the new type of unit will be done at rail heads. In certain areas it will be necessary to feed the unit at a central dump point near the line.

By loading at the rail head the dope material is handled only once. After loading, while in transit to the job, the dope is being heated, and within 3 hours it is ready to apply. Mechanical agitation for the heating unit is done by a spiral screw-type agitator operating at 12 to 16 r.p.m. driven by a 5-hp. gasoline engine.

Installing well points for dewatering

Safety COLOR Code ... for drilling rigs

by W. B. Cox*

Colors can be used as visible guides to safety on rotary drilling operations. Further, they can be set up for identification of specific "classes" of safety. Paint cost per rig: $75: time: 5 days at odd intervals while drilling.

PAINT has long been used on drilling rigs to protect them from rust—to make them last longer. More recently it has been used to make rigs look better—to promote good housekeeping. But paint can do more for rigs than protect them and make them look better—it can, if used properly, make drilling rigs safer to operate. Color in paints has, for a good many years, been used for functional purposes and the use of a safety color code is not new. However, not much has been done to promote a standard safety color code for use in the oil fields and in particular for use on drilling rigs.

The United States Bureau of Mines, in cooperation with the American Association of Oil Well Drilling Contractors, paint manufacturers, and various oil companies are proposing that a standard safety color code be adopted and used for all drilling rigs. In order to get the above proposal before the industry, the Bureau of Mines is producing a 16-mm. colored sound motion picture which indicates various applications of one or more proposed safety color codes on drilling rigs with the thought that out of this picture will evolve a standard safety color code acceptable to all people who have to do with drilling rigs.

There are in general three requirements that must be met if a safety color Code for drilling rigs is to be successful:

1. It must be simple.
2. It must promote safety.
3. It must be generally adopted.

The safety color code must be simple in order not to be confusing. The code should utilize as few colors and color combinations as is consistent with the function of promoting accident prevention. It should be easy to apply.

It must promote safety in that specific colors must identify specific types of hazards and specific parts of the equipment must be painted in accordance with the hazards they present. Hit-and-miss use of a safety color code will result in confusion.

In order to accomplish the most good, a standard safety color code must be accepted by all people who have to do with drilling rigs. The following safety color code appears to satisfy the first two of the three requirements:

*Division safety supervisor, Texas-Louisiana Gulf Coast Division, Stanolind Oil & Gas Co., Houston.

Color Identification

A bright red color shall be the basic color for fire-equipment apparatus and installations. The symbol for color-blind persons shall be a red square. Red shall be used for no other purpose on a drilling rig.

A bright yellow shall be the basic color for strike against, stumbling, or falling hazards. The symbol is yellow and black stripes.

A bright orange shall be the basic color for alertness to mark dangerous equipment or point of operation that presents cut, bite or pinch, explosive, or electric shock hazards. The symbol is an orange triangle.

Green shall be the basic color for first-aid and personal protective equipment and for safety instructions. The symbol shall be a green cross on white background, or a white cross on green background.

Blue shall be the basic color for precaution to warn of equipment or machinery under repair and electrical controls. The symbol shall be a blue circle.

White shall be used for marking traffic lanes and safe working areas to promote good housekeeping.

Gray shall be used on trash containers to promote good housekeeping. The symbol shall be a white star.

The above seven colors, in conjunction with a suitable background color, have been applied to a drilling rig and motion pictures of the rig will be used to advance that particular safety color code.

The application of the safety color code to the drilling rig includes the following:

(Continued on page 107)

Application of Color Code

1. Fire Prevention Red:
- All fire extinguishers
- Red squares to mark locations of fire extinguishers

2. High Visibility Yellow:
- Traveling blocks
- Hook
- Swivel
- Elevators
- Underside of monkey board
- Rotary hose (steel)

High Visibility Yellow and Black Stripes:
- Bottom edges of all steps at all landings on derrick stairs
- Cattle guard at entrance to lease
- Tong retractor post
- Rathole
- Edges of all raised platforms on derrick floor
- Edges of all steps around boiler and pumps and shall shakers
- Tong backup post

3. Alert Orange:
- 2-In. stripe around rotary table
- 2-In. stripe along body of pipe tongs
- Handles of rotary slips
- Stripe around inside flange of cathead
- Inside of all guards
- Inside cover of all electric switch boxes
- Handle for emergency throttle valve
- Handle for spinning cathead control
- Valves and valve handles and wheels on blowout-preventer equipment
- Stripe on drum flange
- Cover for mouse hole
- Stripe around lower edge of elevators
- Rotary drive bushing

4. Precaution Blue:
- Entire crown black
- Outside of electrical switch boxes

5. Safety Green:
- First-aid kit

The following Safety Signs:
- Safety First—Do Not Come on the Derrick Floor Without Your Safety Hat (One at each set of derrick floor steps)
- Safety First—Watch Your Step (One at each step without handrails)
- Safety First—Keep Good Tools on Work Bench (One on each work bench)
- Safety First—First Aid Kit (inside building) (on tool house)
- Safety First—Wear Your Goggles (at grinding wheel)

COPPER-STRIP CORROSION TESTS

by I. A. Bolt

In determining corrosiveness of various light-oil products by current test procedures it was observed that copper-strip corrosion manifests itself in a series of distinct colors. Degree of corrosion correlated with the colors. Based on this tentative sets of corrosion standards have been prepared for comparison and specification purposes. Work is in progress to establish permanent standards in which color of the strips also will be a function of the amount of corrosive sulfur present. The author is assistant superintendent of technical service for the research department of Standard Oil Co. (Ind.) and this paper was given at the fifth joint technical meeting of that company's research department recently held at French Lick, Ind.

CORROSIVENESS of petroleum products as indicated by various copper-strip corrosion tests is considered to be important property of these products. Currently, maximum allowable corrosion limits, although not always clearly defined, are included in the specifications on motor and aviation gasolines, industrial naphthas, diesel fuels, domestic fuel oils, etc.

Studies have been carried out at Whiting during the past 2 years on methods of sweetening or finishing distillate fuels and industrial naphthas with a view to meeting more rigid corrosion requirements. In the course of these studies two questions invariably came to the fore: (1) What degree of corrosion can be tolerated as indicated by any given test method? and (2) what type or types of sulfur compounds are corrosive in the various tests?

The first question is complicated by the fact that the degree of corrosion as indicated by the appearance of the test strip is usually defined in rather vague terminology and further by the fact that the order of appearance of colors, which indicates the degree of corrosion, does not undergo a smooth progressive change from no discoloration to a darkened strip. As a result of this, purchasers of large amounts of industrial naphthas have classified naphthas of intermediate corrosiveness as unsatisfactory while accepting more corrosive stocks as satisfactory.

An answer to the second question—what types of sulfur compounds are responsible for corrosion in the various tests—was desirable to determine what type of finishing procedure would be feasible or necessary to suppress or eliminate the type of sulfur compounds causing corrosion in any given test method.

This article presents a summary of the work done to date with a view to developing corrosion standards so that once the maximum allowable corrosion limit is established for a given product, the strip obtained on the product can be compared with the standards and rated either as passing or not passing. Also, some information is presented on the types of sulfur compounds which cause corrosion in the current test methods. Although the final results, when obtained, may be applicable to heavy-oil products, the discussion is limited to tests and results on light-oil products on which these initial studies are being made.

Current Corrosion Tests and Their Import

Major variables affecting the degree of corrosion in the various test methods are: (1) Amount of corrosive sulfur or sulfur compounds present, (2) temperature at which the test is performed, and (3) time of exposure of the copper strip in the test. In current corrosion test methods on light-oil products the last two variables are fixed in order to determine the first. A summary of these tests is presented in Table 1.

TABLE 1—CURRENT TEST METHODS ON LIGHT PETROLEUM PRODUCTS

Test method—	Strip size	Temp. (°F.)	Exposure time
A.S.T.M. D-130	0.5″ x 3″	122	3 hours
A.S.T.M. D-484	0.5″ x 3″	212	3 hours
A.S.T.M. D-235	0.5″ x 3″	*B.P.	30 min.
Philadelphia	0.25″ x 1.5″	variable†	variable†

*Slightly above the initial boiling point of products under test. †Strip in flask during A.S.T.M. distillations.

The A.S.T.M. D-130 (3 hours at 122° F.) test is currently imposed on motor gasolines and to some extent on distillate fuels. Requirements are that no visible or appreciable change shall occur in the appearance of the strip. Passing this test presumably assures that no harmful corrosion of copper or copper alloys in automotive or burner fuel systems due to sulfur will occur.

The A.S.T.M. D-484 (3 hours at 212° F.) test is much more drastic than the D-130 test. Currently it is imposed on diesel fuels and is being considered as such, or with some modification in time of exposure, for use on distillate fuels. For use on diesel fuels a perfect strip at the end of the test is not required by prominent manufacturers of diesel equipment. In connection with this test, therefore, the question arises as to interpretation of corrosiveness and degree of corrosion that can be tolerated.

The A.S.T.M. D-235 (30 minutes at boiling point) test may or may not be more severe than the D-484 test depending upon the initial boiling point of the product. It is imposed primarily, if not exclusively, on industrial naphthas. In most instances a perfect strip after exposure to the product is not required and therefore interpretation and tolerance are also of importance on strips obtained by this method. Passing this test presumably insures the user of the product that no darkening of light-colored, lead-base paints will occur in storage; that no localized corrosion (pimpling) of metal surfaces will occur when used as a thinner in finishes applied to metal surfaces; or that no harmful corrosion will occur when such a product is used as a cleaning agent for metal surfaces.

The Philadelphia test (strip in flask during A.S.T.M. distillation) is the most drastic corrosion test shown in Table 1. As originally proposed by the Philadelphia Paint and Varnish Club, stipulations were that the strip should show no black after exposure. It is imposed by some varnish manufacturers on naphthas used as the diluent in the hot open-kettle method of thinning resins in the process of varnish manufacture. No blackening in this test presumably indicates that the naphtha contains no sulfur which will react with the metals present, e.g., lead as lead resinate, in the varnish during its manufacture. However, some varnish manufacturers believe that naphthas which show a minimum amount of corrosion in this test are desirable in order to insure a minimum of darkening of clear varnishes.

Nature and Cause of Corrosion

In the course of making the foregoing tests on various refinery products it was observed that copper-strip corrosion manifests itself in a series of rather distinctive colors and

that, regardless of the type of stock or severity of the test, the color changes are invariably in the same order. For example, a strip which will turn black in the 3 hours at 212° F. test, will progressively undergo definite color changes. A freshly polished strip will pass through various shades of orange, red, lavender, silver or brassy, then multicolored or peacock, and finally turn black. The relative corrosiveness of various stocks, using a given test method, can be estimated, therefore, by noting the color of the strip at the end of the test. This phenomenon of progressive color change naturally led to the idea of developing copper-strip standards for comparison and classification as to degree of corrosion.

That corrosion, even a slight orange discoloration of the strip, is due to sulfur was confirmed by immersing the corroded strips in dilute hydrochloric acid and noting the evolution of hydrogen sulfide. Also, the addition of elemental sulfur or certain corrosive sulfur compounds to a noncorrosive distillate produced these same color phenomena—the color formed depending upon the amount of corrosive sulfur added and upon the severity of the test method.

Types of sulfur compounds which cause corrosion or color formation from orange to black in the various test methods are: elemental sulfur, hydrogen sulfide, and polysulfides. Mercaptans, thiophenes, sulfides, and disulfides are believed to be noncorrosive to copper unless sufficiently high temperatures are attained in the test procedure to decompose these types of compounds. An example of such decomposition occurs in the case of organic disulfides at temperatures above about 300° F. The decomposition of disulfides, formed from mercaptans on "sweetening" the higher-boiling industrial naphthas, make it particularly difficult to pass the Philadelphia test. The presence of as little as 0.008 per cent sulfur as high-boiling disulfides will cause blackening in this test.

Color of the strips obtained by any test method is believed to vary with the thickness of the copper sulfide film formed on the surface of the copper strip and is believed to be due to light interference phenomena.

Standardization of Corrosion Strips

First method of preparing corrosion standards for classification or rating of products was an arbitrary one. Sets of standards were prepared by varying the time of exposure in a rather corrosive petroleum distillate at a temperature of 212° F. In so doing, the amount of corrosive sulfur was held constant in that the same stock was used, obviously, the second major variable, temperature, was held constant at 212° F. The third major variable, time of exposure, was arbitrarily but successively increased for each strip and the test stopped when a distinct color change was observed from that of the previous strip. Sets of strips prepared in the above manner, or comparable strips, have been submitted to various departments and laboratories within our company for tentative reference standards. These sets of standards, consisting of 13 strips, were numbered from 0 to 12 and covered the entire range from no corrosion to black and scaly. The numbers and descriptions of these strips are presented in Table 2.

TABLE 2—CORROSION NUMBER AND DESCRIPTIVE TERMS FOR STANDARD COPPER CORROSION STRIPS

Corrosion number	Name
0	Perfect
1	Light orange
2	Dark orange
3	Claret red
4	Lavender
5	Silvery lavender or silver
6	Brassy
7	Brassy red
8	Peacock
9	Transparent black
10	Graphite black
11	Mat black
12	Scaly black

Obviously, the above method of producing sets of standard reference strips is not desirable because the time of exposure cannot be fixed as long as the amount of corrosive sulfur is not established. Furthermore, a more desirable method of preparing sets of standards is to fix the time of exposure and vary the amount of corrosive sulfur to be added to a noncorrosive product. To accomplish this objective, considerable effort has been put forth (1) to find a suitable corrosive sulfur compound which can be added in incremental amounts to an originally noncorrosive stock or solvent, (2) to find a standard noncorrosive solvent and (3) to establish the most suitable procedure to prepare satisfactory reference strips.

Regarding a standard corrosive sulfur compound, use of hydrogen sulfide is ruled out because normally it is not present in finished petroleum products and its addition in known amounts would be difficult. Pure organic polysulfides, such as dibutyl tetrasulfide, are not obtainable and difficult, if not impossible, to prepare. Currently, the use of elemental sulfur or a brand product such as sulfurized dipentene (Ortholeum 202 made by E. I. du Pont de Nemours & Co., consisting of approximately 33 per cent sulfur) appear quite promising. Since sulfurized dipentene varies in composition it would be necessary to set aside a batch of this product for reference purposes. In the final production of corrosion standards it is planned that the number of the strip, or degree of corrosion, will be a mathematical function of the amount of corrosive sulfur present.

Regarding a suitable noncorrosive solvent the most promising found to date are pure n-heptane obtained from Westvaco Chlorine Products Corp. and cetane obtained from the du Pont company.

The most feasible test method to prepare similar standard reference strips appears to be the A.S.T.M. D-484 (3 hours at 212° F.) or the A.S.T.M. D-130 (3 hours at 122° F.) test. The more drastic and shorter tests give poorer reproducibility than the above methods. If one of the above tests is used it is necessary that the technique or method of test be quite accurately defined. Minor variables affecting reproducibility in these methods are (1) preparation and handling of strip, (2) amount of solvent or oil used in the test and (3) the removal of oil from the strip prior to rating.

Preparation and Preservation of Sets of Corrosion Standards

Various methods for the preparation and preservation of sets of standard strips have been tried. The current method is to juxtapose them on the inner periphery of a glass jar, the strips being held in position by packing the jar with glass wool, flushing with nitrogen and then sealing the cover. A method of this type is undoubtedly the most desirable since actual strips are used. However, the sets are somewhat clumsy to handle and a considerable amount of time is required to prepare them.

Strips set in viscous liquids such as Canada balsam undergo a color change presumably because of further light interference. Currently, a method of placing the strips between laminated plastics is being investigated. Also, an attempt was made to obtain reproductions by means of colored (Kodachrome) photography but this method appears to have little promise. A method of printing using colored ink will be investigated.

Acknowledgment

Work on this project is being carried out by A. J. Steinbach and W. Nelson of the Whiting research staff. The writer wishes to thank them for their patience and close observations required in carrying out the numerous tests required for a project of this type.

High-Compression Engines

DETROIT. — The Continental-type engines with which Kaiser and Frazer cars are equipped have the highest compression ratio, it is believed, of any regular engines now in production in the United States, Lee Franklin, chief experimental engineer, Kaiser-Frazer Corp., said recently. These engines have a compression ratio of 7.3 to 1, and operate satisfactorily on regular or housebrand gasoline.

PORTLAND CEMENTS — in the OIL Industry

by N. C. Ludwig*

ENGINEERS and chemists who deal with oil-well production problems tend to regard cement or cement-water mixtures in terms which apply to drill muds. That is, they suspect that viscosities of the cement slurries can be controlled by the addition of chemicals or dispersing agents such as are used with drill muds or that certain gels may be added to cement slurries to give water-retention properties as is common practice with drill muds. This problem is more complicated when dealing with portland cements because of the dual requirements of maintaining fluidity of the cement slurry during placing and obtaining subsequent rapid hydration and development of strength. In this paper, an effort will be made to enumerate some of the factors that affect the physical properties of plastic and hardened portland cement.

It is generally recognized today that $3CaO.SiO_2$, $2CaO.SiO_2$, $3CaO.Al_2O_3$, MgO and members of the solid solution series of $2CaO.Fe_2O_3$ and $6CaO.2Al_2O_3.Fe_2O_3$ are the compounds which would be present in a cement clinker composed only of CaO, SiO_2, Al_2O_3, Fe_2O_3 and MgO, and annealed so as to allow complete crystallization. However, commercial cements always contain minor amounts of Na_2O and K_2O and often contain traces of other oxides such as SO_3, TiO_2, P_2O_5 and MnO. Furthermore, during the burning process, a part of the kiln feed is melted and, under the usual conditions of cooling, a part of the liquid does not crystallize but remains in the clinker as a glass. It is to be expected that the glass will contain some of each of the components of the clinker.

Until recently, it was believed that a compound of the composition $4CaO.Al_2O_3.Fe_2O_3$ existed in cement. It has since been reported that this is not a true compound but a member of a series of solid solutions. Because of this belief in the existence of such a compound, much work has been done with this composition and it has been the practice for a number of years to calculate the compound compositions of cements in terms of $3CaO.SiO_2$, $2CaO.SiO_2$, $3CaO.Al_2O_3$, $4CaO.Al_2O_3.Fe_2O_3$ and MgO. Hence, in this paper, the cements will be considered in terms of these five materials.

*Research engineer, Universal Atlas Cement Co., Buffington, Ind. Condensation of paper presented before the Tulsa section, American Chemical Society.

Raw Materials

Limestones, oyster shells, and marl are the common sources of lime. Clays and shales usually are the sources of the silica, alumina, and ferric oxides. A few plants use blast-furnace slag to supply these latter components and a part of the lime. Since the introduction of the various types of cements, it is often necessary for many plants to modify the compositions obtainable from these regular raw materials by additions of silica and ferric oxide. It is readily understood that the compositions of cements will vary between different locations with respect to the minor components such as MgO, alkalies, and others because of the variations in the amounts of these materials in the different natural raw materials.

Burning Process

No degree of perfection of purity, proportioning, or grinding of raw materials can, of itself, insure the production of sound portland-cement clinker. Only by the application of intensive heat treatment during the burning process is the desired chemical compositions obtained. In this country, rotary kilns are used for the burning process and the raw feed is introduced into the upper end of the kiln either as a filter cake, slurry, or as a powder. The slow rotation of the kiln, which is inclined slightly downward toward the lower end where the fuel is introduced, causes the feed to pass from the upper cool end to the lower hot end. The fuel may be oil, gas, or pulverized coal.

Many chemical reactions occur during the process of burning which entirely change the character and composition of the original materials. The raw material first loses water and, as it reaches hotter parts of the kiln, carbon dioxide is evolved from the calcium and magnesium carbonates, and the reactions of CaO with Al_2O_3, Fe_2O_3, and SiO_2 begin. At a temperature of about 1,280° C. (2,336° F.) the first liquid is formed which is a solution of calcium aluminate and calcium aluminoferrite containing small amounts of SiO_2, MgO, and the minor components. At this point the solid phases are principally CaO and $2CaO.SiO_2$ which react to form $3CaO.SiO_2$ as the temperature is raised. The rate of this reaction accelerates with increasing temperature and is very rapid as the temperature approaches the maximum of 2,700° to 2,800° F.

Both $2CaO.SiO_2$ and $3CaO,SiO_2$ exist in the solid state at these high temperatures. During the cooling process but before the temperature has been reduced to the point of complete solidification of the liquid, the iron and alumina begin to crystallize out of the liquid with the remaining lime to form tetracalcium aluminoferrite, $4CaO.Al_2O_3.Fe_2O_3$, and tricalcium aluminate, $3CaO.Al_2O_3$. The magnesia is found partly in the glass phase and partly in the form of periclase, MgO, in the clinker.

Control of Setting

Since 1883, improvements in equipment for grinding raw materials and clinker and for the burning of the kiln feed have given rise to the problem of controlling and setting characteristics of the cement. Generally, cement sets too rapidly for satisfactory use. This led to general adoption of grinding small quantities of gypsum $CaSO_4.2H_2O$ with the clinker which was found to be effective in preventing the cement from showing a flash set. The manner in which gypsum prevents flash set is not clearly established. However, it is generally believed that it functions by its reaction with $3CaO.Al_2O_3$ because this compound by itself reacts so rapidly with water as to make it

impossible to prepare specimens from a paste of it in water. For many years it was believed that the only benefit to be derived from gypsum in cement was this control of flash set, but recent work has shown that in many cements gypsum accelerates the rate of hydration. The shrinkage of mortar specimens when stored in air and the expansions of mortar specimens when stored in water vary with the SO_3 content of the cement. Because of variations in the compositions of cements, the SO_3 content which gives the maximum strength at early ages and the least shrinkage and expansion of mortar specimens differs for different cements. Hence, the former idea of limiting the SO_3 content of cement to a fixed value is now being reconsidered and specifications modified.

Composition Related to Certain Physical Properties

It is generally agreed that the $3CaO.SiO_2$ and $2CaO.SiO_2$ are primarily responsible for the strength properties of portland cement. The former reacts much more rapidly with water than does the latter and accordingly produces the early strength. The $3CaO.SiO_2$ hydrolyzes to give $Ca(OH)_2$ and a hydrated calcium silicate which is the cementing material. This hydrated silicate is amorphous under present methods of determining crystalline structure. Hence, it has not been possible to determine its composition accurately. However, from indirect studies, it appears that its ratio of CaO to SiO_2 is close to 2 : 1. On this basis, the $3CaO.SiO_2$ probably hydrates directly to $2CaO.SiO_2$ hydrate in cement pastes in which the solution is saturated with $Ca(OH)_2$ released by the $3CaO.SiO_2$.

As pointed out above, $3CaO.Al_2O_3$ reacts with gypsum to form calcium sulfoaluminate. However, since cements generally do not contain sufficient gypsum to combine with all of the potential $3CaO.Al_2O_3$, it is believed that the excess aluminate hydrates to $3CaO.Al_2O_3.6H_2O$.

There is some indirect evidence that the aluminoferrite combines with gypsum to give calcium sulfoaluminate and calcium sulfoferrite. Also that the aluminoferrite not combined with gypsum reacts with $Ca(OH)_2$ and water to form hydrated $3CaO.Al_2O_3$ and hydrated $2CaO.Fe_2O_3$.

When the cement minerals react with water they release variable amounts of heat. Values in calories per gram for the principal materials have been reported as follows:

$3CaO.Al_2O_3$	207
$3CaO.SiO_2$	120
$4CaO.Al_2O_3.Fe_2O_3$	100
$2CaO.SiO_2$	62

In the reaction of $3CaO.Al_2O_3$ with gypsum to form calcium sulfoaluminate the heat evolved is 149 calories per gram of SO_3. Hence, in any calculation of the heat of hydration of portland cement, the values for the heat of hydration of $3CaO.Al_2O_3$ should be corrected for the portion which combines as sulfoaluminate.

Types of Cement

In 1927 the first special type of portland cement was produced. This was high-early-strength cement which was produced by increasing the $3CaO.SiO_2$ content of regular portland cement clinker and by grinding the product to a higher surface area. This type of cement took care of the demands for higher early strengths, but it was not long before demands were forthcoming for improvements in directions other than that of strength.

Low-heat portland cement was developed and first used in the Morris Dam in California (1932-34), followed by its use in Hoover Dam (1933-35). In the manufacture of low-heat cement, it is necessary to decrease the compounds responsible for most of the heat generated during the hydration of portland cement. This results in a comparatively slow gain in strength which is partly compensated for by grinding the clinker to a somewhat higher surface area than that of regular portland cement.

The slow rate at which low-heat portland cement developed strength did not permit rapid rates of construction of the Norris Dam in Tentures. To overcome these difficulties a moderate-heat-of-hardening type of portland cement was evolved. This was accomplished by holding the $3CaO.Al_2O_3$ content to a low value and permitting the $3CaO.SiO_2$ content to equal approximately that of regular portland cement. This type of cement was first used in the construction of the Norris Dam in Tennessee (1933-36).

During this period of development of special cements there was a demand for a cement which would have greater resistance to attack by sulfates from ground waters and soils than was generally obtained from regular portland cement. This led to the development of a special portland cement having relatively low $3CaO.Al_2O_3$ content.

Committee C-1 of the A.S.T.M. and the federal Government have adopted specifications for five types of portland cement. They are:

Type 1—For use in general concrete construction when the special properties specified for Types 2, 3, 4, and 5 are not required.

Type 2—For use in general concrete construction exposed to moderate sulfate action, or where moderate heat of hydration is required.

Type 3—For use when high early strength is required.

Type 4—For use when a low heat of hydration is required.

Type 5—For use when high sulfate resistance is required.

Observations made during the late 30's showed good performance of Type 4 cement in reducing the amount of cracking in mass concrete structures such as dams, and that the problem of sulfate resistance had been taken care of by the use of Type 2 and Type 5 cements. However, scaling of concrete pavements became serious, due largely to the increase use of deicing salts.

Air Entraining Portland Cement

Research directed toward the problem of scaling of concrete pavements caused by the use of deicing salts gave rather tangible evidence by 1937-38 that the answer was not to be found in the compound composition of cement but in the use of an air-entraining agent interground with the cement. The results of this and later research in which a number of different air-entraining agents were tested showed that very small quantities of these materials greatly increased the resistance of the concrete to alternating freezing and thawing which is considered one of the principal criterions of the durability of concrete. The conclusion from the results of these studies is that resistance to frost action is not dependent upon the air-entraining agent but upon the quantity of air entrained by the concrete.

This type of cement is now specified by a number of state highway departments and is also being widely used in general concrete construction work, even where resistance to salt and frost action is not required. The use of this cement in the latter type of construction is due to the fact that the entrained air, besides increasing the resistance to salt and frost action, improves the workability characteristics of the concrete and decreases the tendency towards segregation and bleeding. The increased workability makes it easier to fill forms, especially those containing large amounts of reinforcing steel. The decreased tendency to segregate produces a more homogeneous concrete and decreased bleeding tends to eliminate sand streaks in the surfaces of walls.

The manner in which entrained air produces these results is believed to be found in the nature of the air bubbles. All concrete contains some air; however, the small amount of air in concrete made from normal cement is in the form of a few rather large bubbles, whereas that in air-entrained concrete is in the form of a very large number of tiny disconnected bubbles which do not readily unite to form larger bubbles. These are predominately less than 50 microns in diameter. These tiny bubbles may be visualized as fine particles similar to the fine particles of cement and sand. As such, they greatly increase the surface exposed to the water and accordingly assist the fine particles of cement and sand in immobilizing the water in the plastic concrete, thereby greatly reducing bleeding and the channels resulting

from it. Also acting as fine particles they augment the action of the fine particles of sand and cement in producing a more cohesive mortar with the use of a smaller amount of water.

Since each air bubble is surrounded in the hardened concrete by hydrated cement paste, the air cannot be displaced by water under atmospheric pressures. Accordingly, the bubbles do not act as space which can absorb water. Hence, the porosity of the concrete as measured by its ability to absorb water is not increased by the entrained air. On the other hand, as the concrete is cooled, the contraction and compressibility of the air provides space into which water can be forced by the pressure resulting from the formation of ice from freezable water in the hardened cement paste. It is obvious, of course, that the air will expand when the temperature is raised and force the water back into the cement paste. Thus, the entrained air provides space to accommodate the expansion which occurs when water in the hardened cement paste freezes but it does not increase the space available to water at temperatures above the freezing point of water.

Oil-Well Cements

Many of the uses of cements in oil fields are similar to those used for construction. For these uses, regular portland cement and special portland cements resistant to moderate sulfate action, or with moderate heat of formation or having high early strength are usually recommended. These cements may, of course, be used in wells in which high temperatures are not encountered but are not recommended for use at temperatures above about 140° F.

A cement for use in oil wells should have the following properties:

1. The cement slurry should remain fluid for a period of several hours at temperatures of 140° to 200° F. and then should stiffen and harden rapidly.

2. The cement slurry should remain pumpable during the first few hours even when allowed to stand at rest for short periods of time.

Special cements not included in the types discussed above are manufactured for use in oil wells in which the temperatures exceed about 140° F. These cements are of two types. The one is usually known as a slow-set cement in which the rate of setting is controlled primarily by the composition of the cement. The other is known as a retarded oil-well cement in which both the time and rate of setting are controlled by additives.

In the first type, sufficient iron oxide is added to the raw mix to convert very nearly all of the Al_2O_3 to $4CaO.Al_2O_3.Fe_2O_3$ or, in some cases, the ferric oxide content is sufficient to more than combine with Al_2O_3 as this compound. Cements of this type hydrate and develop strength slowly and their slurries remain pumpable for several hours.

Cements of the second type usually are ground to specific surfaces of 1,200 to 1,400 sq. cm. per gram which makes their rates of hydration less difficult to control than would be the case if they were ground to specific surfaces of 1,600 to 1,800 sq. cm. per gram common to regular portland cement and to portland cement types resistant to moderate sulfate action or with moderate heat of hydration.

Effects of Mud-Treating Chemicals

In most uses of cement there is not much opportunity for it to become contaminated with harmful materials, but in the cementing of oil wells there are opportunities for the cement slurry to become contaminated with brine waters and with muds. Relatively small amounts of some of the chemicals used in the preparation of these muds affect the stiffening times, viscosities, and rates of hardening of cement slurries.

Testing Oil-Well Cements

One of the difficult problems in the manufacture of most products is the development of testing procedures which will accurately predict the behavior of the product in service. In the case of oil-well cements, this has meant the development of special equipment and testing procedures. This equipment consists essentially of various types of consistometers for testing the cement sluries at high temperatures. A number of procedures have been developed for consistometer tests. Most notable of these are the well simulation procedures in which actual cementing conditions for different depth wells are approximately simulated.

The setting time and strength tests are usually made at high temperatures under atmospheric pressure. At the present time there are no uniform methods specified for the consistometer and strength tests.

Midget Catalytic Cracker Starts Operation

(Continued from page 81)

recovers the small amount of catalyst fines—0.7 per cent b.s. and w.—which escapes the cyclones and returns it to the system along with fresh or recycle charge, while the major portion of the recycle oil is normally not recycled at all, but is removed, clear, as furnace or gas oil. However, it may be recycled in whole or in part, as the operator may wish.

The remainder of the plant is conventional. The refractionator formerly was employed to handle the thermally cracked distillate. It is now provided with two side-cut strippers, from which a variety of desired fractions may be drawn for recycle, or for sale as products now much in demand. A condenser for the overhead gasoline vapors and an accumulator which serves as a reflux drum, a gas compressor to handle the uncondensed gases to the vapor recovery plant, and coolers for the side streams complete the main equipment items in the unit's makeup.

Typical Operation of Unit

Currently the raw charge being fed to the unit has an A.P.I. gravity of about 29.5° and is being processed at the rate of 3,500 to 4,000 bbl. per stream day. This charge of gas oil is fed to the unit through heat exchangers, at a temperature of about 400° F. Vapors and catalyst, and steam at the rate of about 200 lb. per hour mix at the point shown in the picture displaying the assembly of the lines beneath the regenerator. The steam temperature is approximately 300° F. and the catalyst is 1,080° F.

The mixture enters the reactor at about 850° F., a "standard" reaction temperature under one set of operating conditions. The normal ratio of catalyst circulation to charge is 9 lb. of catalyst per pound of charge stock.

The catalyst being employed is a silica - alumina — SiO_2-Al_2O_3 — microspherical catalyst of high reactivity and long life, according to engineers acquainted with its use. It weighs about 50 lb. per cu. ft., and develops fines slowly. Loss in normal operation amounts to 1,100-1,200 lb. per day when charging 4,050 bbl. of oil, or a rate of loss of catalyst of 0.20 to 0.25 lb. per bbl. charge. Under conditions employed recently about 800 bbl. of recycle stock is recirculated per day.

After mixing, the catalyst-oil-steam mixture enters the reaction chamber, which is lagged to maintain reaction temperature, where the cracking reaction takes place. The catalyst drops from the vapor stream, passes through the preliminary stripper section set in the body of the reactor and into the main stripper tower alongside the reactor, where last traces of hydrocarbons are removed from the catalyst The vapors pass through the cyclone, where practically all the entrained catalyst is removed and drop back into the reactor. The last traces of catalyst are recovered as slurry from the bottoms of the tower, and returned as recycle to the system. The vapors are flashed in the tower, the overhead being cut to end-point requirements for motor fuel. One or more side streams are taken as recycle or as finished products such as light and heavy furnace oil, diesel fuel, kerosine, burning oils, etc., as the needs of the sales department may require.

The spent catalyst is stripped with steam or other medium in the main stripper column, the vapors return-

ing to the reactor to mingle with the main vapors. The stripped catalyst drops into the regenerator just below the cyclones, to meet the current of hot air-flue gas mixture which burns of the carbon deposited on the catalyst during the reaction. Again, as in the reactor, the double cyclones knock back practically all the catalyst entrained in the flue-gas stream.

The essentially catalyst-free flue gas, at a temperature of about 1,050° F., passes through the vertical waste-heat boiler, emerging at the bottom at about 385° F. and thence to the air through a control valve which maintains the differential pressure between the reactor and generator. The water and steam flash in the disengaging drum to produce 7,500 lb. of steam at about 125-130 lb. pressure.

The air compressors, of which there are three 300-hp. units installed in the compressor house to supply air to the regenerator, force air into the base of the regenerator section at 23 psi., and 275° F., at the rate of 7,000-8,500 ft. 3 per minute. With an oxygen supply so controlled, the temperature of the catalyst regeneration is held at or below about 1,000° F., a value which causes no damage to the catalyst's efficiency. The catalyst drops to the bottom of the regenerator and feeds into the charge-catalyst-steam mixing assembly referred to above, continuing the cycle of the unit.

From the standpipe leading the regenerated catalyst to mixture with the charge, any given amount of catalyst may be withdrawn from the system and disposed of as may be fitting. Fresh catalyst, to replace that disposed of as spent, is added between the cyclones and the grid near the bottom of the regenerator. This arrangement permits the removal of spent catalyst without interruption of operations as outlined above.

Typical yields and inspections of products are shown in the accompanying table. It is typical of catalytically cracked gasoline that, while the end point is 415° F., the octane rating by either method is high. Note also that the vapor pressure of this gasoline is only 6.7 lb. The total yield of motor fuel which can be made by adding butane produced from the unit, to this gasoline will be increased a few per cent when bringing the vapor pressure up to 10 to 12 lb. Reid, for a commercial product.

The heating oil fraction, or light furnace oil, has a 665° F. end point; samples inspected show a light yellow color, clear. The fuel oil is brown-black and nearly opaque, suitable for No. 3 fuel oil or for recycle stock, etc., or can be charged profitably to a thermal cracking unit, it is stated. It must be remembered that these yields and properties may be varied widely as suits the operator, by varying operating conditions, end points, or initial boiling points of products, charge stock properties, etc.

Control Methods, Equipment

The instrumental automatic control of catalytic cracking processes has always been more or less involved and a highly developed system is employed on this small Fluid unit. The most important items in control are the slide valves which control the flow of the finely divided microspherical catalyst to reactor or regenerator. Two main slide valves are used.

Essentially the valves controlling the catalyst flow to reactor and to the generator are operated by a hydraulic oil system, in turn actuated by an air system. As shown in the accompanying illustration the slide valve is direct-connected to a position located in the cylinder, with the hydraulic oil supply connected to one side of the piston, the air supply to

Hydraulic operation prevents "slamming" of the valves on catalyst flow to reactor and regenerator

the other side of the piston. Air is led into the control box (C). As the actuating instrument allows more air pressure to close the valve, in order to avoid slamming the valve, air pressure builds up a differential which slowly forces oil into the cylinder. Oil from tank (D) into cylinder (B) is transferred slowly enough that the valve movement is smooth and gradual, preventing slamming or "hunting." Any oil which leaks past the piston rings into the right side of the cylinder is trapped back to the small float trap, and eventually is returned to the oil tank.

The butterfly valve in the regenerator flue gas line is mounted eccentrically and serves both as a control valve and a pressure-relief valve. The actuating shaft has a right-angled arm or lever against which a rod, actuated by air diaphragm pressure, pushes. This valve is balanced by a counterweight. As air pressure builds up under the control instrument's operation one section of the valve vane, having greater area than the other, is thrown off balance and turns to open, thus relieving pressure. To reduce the pressure drop across this valve and thus lessen the severity of service and accompanying noise and wear, three restriction grids—perforated steel plates—are inserted downstream. With an over-all drop in this system of 18 lb. the grids reduce the pressure drop across the valve itself to 5-6 lb., reducing both noise and erosion effects importantly.

The slide-valve mechanisms are actuated by pneumatic transmitters, in conjunction with pneumatic receivers. Practical inability to rupture the diaphrams of the transmitter is considered one good reason for their use. A detailed discussion of the principle and design of these transmitters is found in The Oil and Gas Journal for March 25, 1943, page 90.

Main instruments used with the unit include recorder controller for

TYPICAL RESULTS OF AURORA UOP FLUID CATALYTIC CRACKING UNIT

Yields—	Bbbl. per std. day	% of fresh charge
Fresh charge stock (Ill.-Mich. gas oil)	4,030	100.0
Fuel gas	....	2.0 Wt. %
C_3 recovered	165	4.1 Vol. %
C_4 recovered	381	9.5 Vol. %
Gasoline	1,691	42.0 Vol. %
Heating oil	1,278	31.7 Vol. %
Fuel oil	657	16.3 Vol. %
Carbon	....	4.7 Wt. %

		Properties of products		
	Charge stock	Gasoline	Heating oil	Fuel oil
Gravity, °A.P.I.	29.9	60.6	31.1	26.6
Specific gravity at 60° F.	.8767	.7366	.8702	.8950
Octane ratings—				
Motor method, clear	....	78	....	....
Motor method, +3.0 cc. TEL/gal.	....	87	....	....
Res. method, clear	....	91	....	....
Res. method, +3.0 cc. TEL/gal.	....	99	....	....
Reid vapor pressure, lb.	....	6.7	....	....
Flash point, °F.	....	....	184	270
100 ml. distillation—				
I.b.p., °F.	....	108	371	....
10%	....	134	464	....
30%	....	169	505	....
50%	....	219	537	....
70%	....	278	572	....
90%	....	352	610	....
End point, °F.	....	415	665	....

raw-oil feed; recorder for catalyst level in regenerator; recorder controller for catalyst level in reactor (operating spent catalyst slide valve); recorder for differential pressure across spent catalyst slide valve; recorder for differential pressure across the regenerated catalyst slide valve; recorder-controller for the differential pressure between reactor and regenerator (operating valve in regenerator flue gas line); recorder for the differential pressure across the reactor riser line through which oil and fresh catalyst pass to the reactor; recorder-controller for reactor temperature (operating regenerated catalyst slide valve); recorder for dense phase and dilute phase temperatures in the regenerator.

Safety Color Code for Drilling Rigs

(Continued from page 94)

All trash containers were painted gray-green with a white star stenciled on them. All walkways were painted gray with a white stripe along the outer edges. The background color used for the rig was a gray-green.

The entire safety color code, including the background color, was applied to a drilling rig in 5 days by use of a spray gun and paint brush by the regular drilling crew without shutting the rig down except for them to paint the blocks. The following amounts of paint are required for the job on an average steam rig:

Item—	Approx. cost
1—Qt. fire-prevention red	$1.57
2—Qt. alert orange	3.14
2—Gal. high-visibility yellow	11.04
1—Qt. precaution blue	1.57
1—Qt. white	1.44
1—Qt. safety green	1.57
1—Gal. traffic black	4.72
10—Gal. green-gray machinery	50.20
Approximate total cost of paint	$75.25

The fact that the above-described safety color code has been applied to a rig does not prove that the identical code should be universally adopted for all rigs but it should provide material for discussion in arriving at a standard to be used on all rigs.

There is no doubt but that the use of color has an important part to play in improving our accident experience on drilling rigs, and its adoption by a majority of the companies having drilling operations will satisfy the third requirement for the success of a safety color code for the drilling industry.

BOOKS

TWENTIETH CENTURY PETROLEUM STATISTICS—1947. Published by DeGolyer & MacNaughton, Dallas. 62 pp. $7.50.

This handbook was first prepared in 1943 in the Office of the Director of Naval Petroleum and Oil Shale Reserves in the Navy Department. The current volume is a compilation of many tables from original sources. Free use was made of data published by American Petroleum Institute, The Oil and Gas Journal, Bureau of Mines, and other government agencies and industrial publications.

INDEX TO A.S.T.M. STANDARDS. Published by American Society for Testing Materials, 1916 Race Street, Philadelphia. 234 pp.

This publication is an adjunct to the 1946 Book of Standards and enables any of the 1,400 standard specifications and tests in the volumes to be located readily. The Index is also of service to those who wish to determine whether A.S.T.M. has issued standard specifications, test methods, or definitions covering a particular engineering material or subject. All items are listed in the Index under key words according to the particular subjects they cover. As a convenience a list is given of the specifications and tests in numerical sequence of their serial designations. Copies are available without charge.

LESSONS IN ARC WELDING. Published by The Lincoln Electric Co., Cleveland. 158 pp. 50 cents in U. S., 75 cents elsewhere.

This series of lessons forms the basis of instruction at the Lincoln Arc Welding School. The objective of the lessons is to present in a concise manner certain fundamental facts of welding, the knowledge of which will enable the welder to use the welding process successfully and economically.

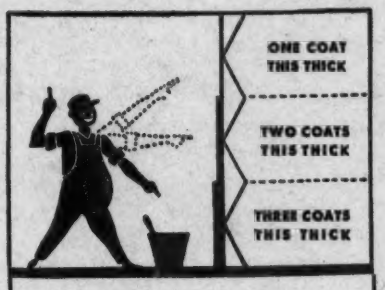
BITUPLASTIC

REG. U. S. PAT. OFF.

A KOPPERS PROTECTIVE COATING

K KOPPERS

USE BITUPLASTIC FOR VAPOR SEALING SURFACES EXPOSED TO CORROSION...



EACH COAT OF KOPPERS BITUPLASTIC EQUALS 5 COATS OF PAINT

Bituplastic is *not* paint

IT IS...

- ✓ a highly refined, easily workable coal tar base coating
- ✓ applied cold with brush or standard spray
- ✓ a complete vapor seal
- ✓ fire retardant
- ✓ impervious to temperatures of −50° F to +500° F
- ✓ applicable to damp surfaces
- ✓ virtually odorless and tasteless
- ✓ quick drying (usually a matter of minutes)

THE BASE IS TOUGH...

a time proved seal against corrosion ... refined coal tar—as a stable dispersion in water—forms a thick plastic coating for the protection of metal, concrete or masonry surfaces.

AND THE COAT IS THICK...

Bituplastic covers heavily; 1/64" to a coat, or about 5 times the thickness of ordinary paint. Successive applications can provide a seamless, nonporous sheath up to 1/16" in thickness, completely resistant to most corrosive conditions.

USE A BRUSH ... OR STANDARD SPRAY

Suggestions for use, rate of coverage and other data are in a new Bulletin on Bituplastic. Ask your distributor or address...

KOPPERS COMPANY, INC.
WAILES DOVE-HERMISTON DEPARTMENT
WESTFIELD, NEW JERSEY

QUESTIONS on TECHNOLOGY

by W. L. Nelson

Consulting Engineer

Kinds of Greases—Strontium

What are the different types of greases? We want to manufacture the new strontium greases because they seem better and offer more possibility than any others.—F. E. C.

There are so many types of greases that no one can build a business on any one of them. Some are superior in one respect whereas others are required for other services. With respect to the strontium greases, the article by Worth and McClennan, of Union Oil Co. of California, entitled, "Strontium Greases—Satisfactory for Severe Service Applications," The Oil and Gas Journal, March 1, 1947, page 74, should be consulted. In general the strontium greases appear to be superior with respect to:

1. **Resistance to** the disintegration **effects of water** at regular and elevated temperatures, and **resistance** to the leaching effect of **hydrocarbons** such as gasoline.

2. **Resistance to** changes in texture due to **repeated heating** and **cooling.** Their freedom from gelation and their anhydrous nature are thought to contribute to these characteristics.

3. **Protective** action **against moisture** or salt-spray corrosion.

4. **Stability at high temperatures**—even 400° F.

5. **Stability of** grease **structure** when mechanically worked.

These greases have been used in rubber and tire-manufacturing plants at 275°-325° F., on a Jacoby conveyor at 350°-400° F. in a large smelter, in a food-processing plant where a wide variety of temperatures and moisture contents was encountered, for aircraft at points involving high temperatures, for ground-glass joints in a large hydrocarbon distillation plant, and as a substitute for conventional brick grease in lubricating the kiln bearings of a brick plant.

Although these applications are noteworthy and it is probable that strontium greases will occupy an important position in the future, the large number of metals that have been considered or are being used in grease manufacture must not be overlooked. Among these are the metallic soaps of aluminum, calcium, sodium, lithium, barium, cerium, chromium, cobalt, iron, lead, manganese, magnesium, mercury, silver, tin, and zinc. Table 1 indicates the properties and characteristics of the major greases. In large part, the table was taken from the August 1945 issue of Lubrication (The Texas Co.).

Petroleum Weed Killers

What kind of petroleum oil is used to kill weeds?—R. M. C.

The recent patent U. S. 2,414,640 indicates that blends of asphalt and aromatic solvent will permanently kill weeds along roadsides and protect the soil from reseeding. Blends of 35-65 per cent asphalt is usually satisfactory and the 60 per cent blend is suggested for new constructions that are surrounded with weeds. Asphalt has long been known to exhibit a scorching effect on weeds but the effect is not permanent unless the aromatic type solvent mentioned above is employed. Socony-Vacuum Oil Co., Inc., Sovosal No. 75 is said to kill weeds among parsnips, parsley, and carrots without imparting an odor or taste to the vegetables. This material is described as a light distillate.

TABLE 1—CHARACTERISTICS OF GREASES

SOAP BASE—	CALCIUM (general)	CALCIUM RESINATE (cold set)	SODIUM (general)	SODIUM (brick type)
Texture	Buttery	Buttery	Fibrous or smooth	Hard or brittle
Dropping point (approx.)	200°-225° F.	275° F.	300°-450° F.	300°-450° F.
Condition after having heated to melting point	Separates	Foams at 200° F. Separates upon prolonged heating	No charge if worked	No charge
Maximum temperature (continuous service)	175° F.	200° F.	300°-400° F.	300°-450° F.
Softening upon working	Fair to poor	Fair to poor	Varies—excellent to poor	Varies—fair to poor
Effect of water	Resistant	Resistant	Susceptible	Susceptible
Primary use	General purpose lubricant for plain bearings and line shafting. Pressure gun and water pumps	Rough heavy bearings at slow speeds, also skids, track curves, and wagon wheels. Oil-field and agricultural machinery	Ball and roller bearings up to medium speeds and light to heavy loads; also wheel bearings and chassis	Locomotive driving journals and similar services
Notes	Some moisture left in grease. Certain greases stabilized with chemicals instead of water can be used at higher temperatures	Cheapness is major factor	Normally does not channel. Highest temperature service except strontium greases	Difficulty is susceptibility to water. Smooth greases used for antifriction bearings. Long fiber greases for chassis lubrication

SOAP BASE—	ALUMINUM	LITHIUM	MIXED SODIUM CALCIUM
Texture	Buttery, rubbery, or stringy but never fibrous	Buttery or stringy	Buttery to fibrous
Dropping point (approx.)	200° F.	400° F.	315° F.
Condition after having heated to melting point	Changes texture upon cooling but does not separate even above melting point	No change if worked	No change if worked
Maximum temperature (continuous service)	150° F. or perhaps 200° F.	300° F.	300° F.
Softening upon working	Fair to poor	Varies—excellent to poor	Varies—excellent to poor
Effect of water	Resistant	Resistant	Susceptible
Primary use	Applications requiring adhesiveness or resistance to centrifugal force	Aircraft or services down to —100° F.	All types ball and roller bearings and special applications at both high and low temperatures
Notes	Does not oxidize or crust readily. Good slow-flow properties. Relatively expensive	Offers possibilities for general purposes	Special types are resistant to oxidation or crusting and can be used for electric motors or seldom-lubricated equipment

AUG

MODERN Rotary DRILLING

Types of Rotary Drives

SPEEDS of rotation of 400 r.p.m. or more are used in certain areas for normal drilling operations, while some fishing jobs may require speeds of less than 10 r.p.m. The range of torque and power requirements imposed on the rotating system of the rig is similarly wide. Complicated by heavy loads of present-day drilling, the resulting problems had their effect on the design of modern rotaries and have resulted in search for arrangements of rotary drives which are more efficient than those used in the past.

As far as mechanical construction is concerned, the design of modern rotaries is such that the demands imposed by heavy loads and high speeds can be met satisfactorily. Precision-cut gears, heavy-duty bearings, positive systems of lubrication, arrangements for definite exclusion of mud, and substantial bases are all standard. The question of rotary drives which will be efficient and economical and at the same time possess the needed speed and torque characteristics is more difficult. Recent trends toward development of different types of independent rotary drives is one of the attempts to find a solution for this problem. The idea of a separate rotary drive is not new. Such drives have been in use for considerable time. In the last few years, however, the subject has received much more attention than in the past.

Independent Rotary Drives

Different types of separate rotary drives possess their own special characteristics, which make them especially applicable to certain conditions. There are, however, certain general advantages and disadvantages which are characteristic of the independent rotary drive as such and are common to all the types.

Advantages. — Maintenance cost of the rig is reduced, since the draw works is used for hoisting only. Transmission of power to the drill stem is smooth, with the resulting decrease in wear of rotary table, kelly, and drill pipe. Noise and vibration are reduced. More accurate torque and speed control is made possible. Utilization of power is more efficient. In power rigs, an additional engine is made available for exclusive use with the pump. Means are provided for emergency operation of the draw works.

Disadvantages. — Additional investment and additional maintenance cost of the drive are among the most important disadvantages resulting from use of separate rotary drives. In certain arrangements, their use results in crowding of the tool-ramp side of the derrick floor. Also, the drive represents additional equipment which has to be rigged up, dismantled, and moved.

Types.—Steam, electric, and internal-combustion-engine drives are used. Electric rotary drives are finding their application also with steam rigs in form of turboelectric drives. Use of the hydraulic torque converters with the internal-combustion-engine drives is increasing.

Steam Drives

Engines used with the steam type of drive are very efficient and they operate with a much better load factor than the large hoisting engines while used for driving of rotaries. Two types of units are in use.

One unit of the on-the-floor type consists of the rotary, driven directly through a two-speed gear box from a steam engine. The whole unit is skid mounted. Close-coupled units, with engine connected directly to the rotary, are also available.

The under-the-floor units consist of a steam engine and a countershaft mounted on the same skids and placed on the ground under the derrick floor. The rotary is driven through an upward-slanting oil-bath chain.

As is the case with other types of separate rotary drives, the units are provided with sprockets for emergency drive from the draw works in case of engine failure.

Electric Drives

Rotaries of the d.c. diesel-electric rigs are usually driven through their own motor-generator sets. The motor is flexibly coupled to the table through a speed-reduction gear. The electric rotary drive offers certain distinct advantages characteristic of the electrical method of transmitting the power.

One of the advantages is the quietness and the smoothness of operation. Another is flexibility of speed control and ease of reversal of the direction of rotation. Still another is the ability to limit automatically the maximum torque which may be developed, thus reducing the danger of the pipe twistoffs. Important also is the ease with which the speed and torque may be measured. Since voltage is proportional to speed and amount of current to the torque, electrical instruments may be suitably calibrated to give the driller a continuous check on the performance of the rotary. If re-recording instruments may be used.

Turboelectric Drives

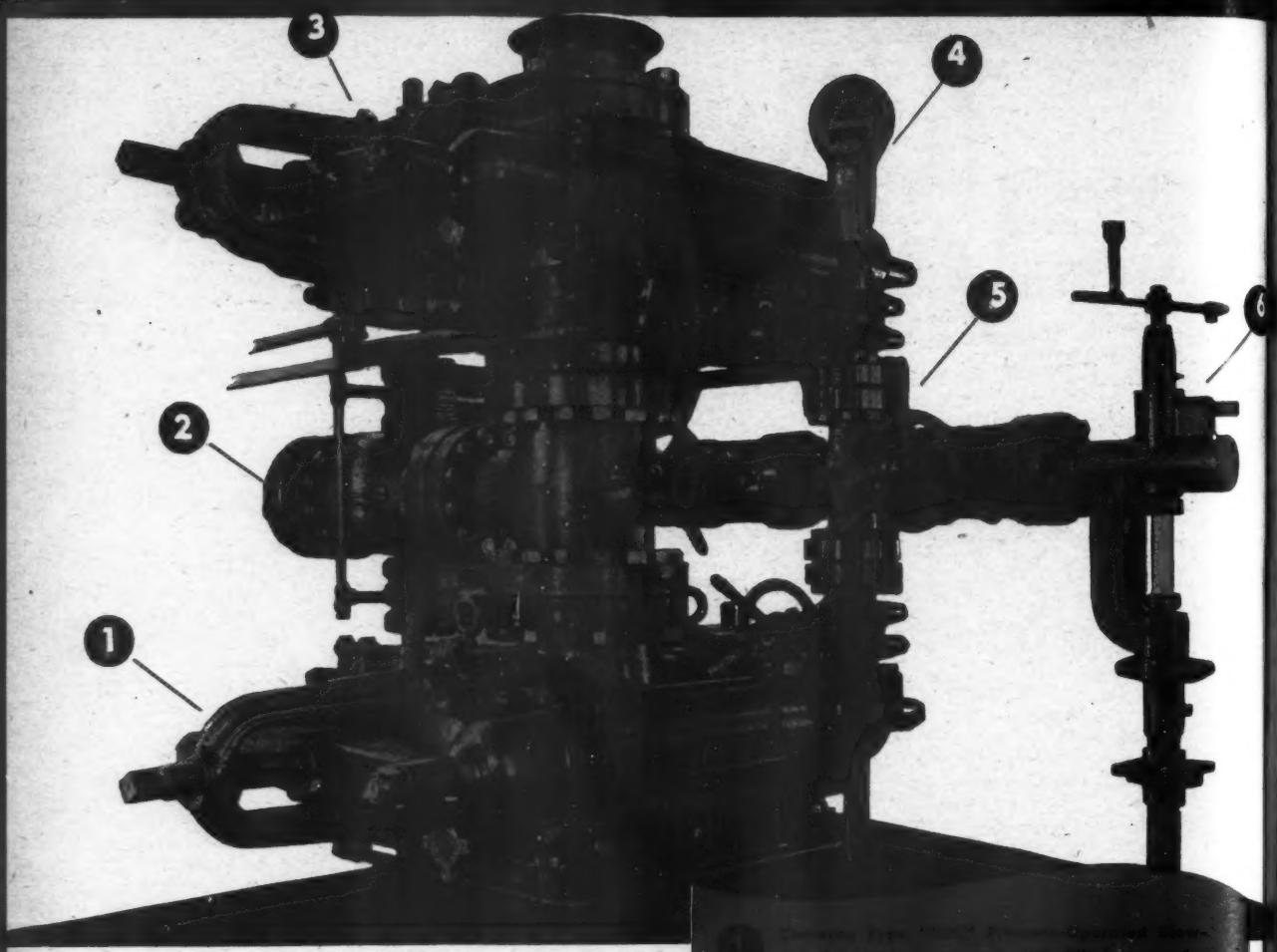
Because of the advantages offered by an electrical rotary drive, experiments have been made with use of such a drive in combination with a steam rig. One major operator used successfully, during the last 3 years, a turboelectric rotary drive with a steam turbine serving as the prime mover of a motor-generator set. The assembly consists essentially of two parts, the turbogenerator unit and motor-rotary unit. Each of the two units is skid mounted.

In the turbogenerator set a single-stage steam turbine, developing 450 hp. at 5,000 r.p.m., drives the main 250-kw. generator through a single-stage reduction gear and flexible couplings. A 15-kw. generator supplies power to the motor of the blower, the rotary motor field, the control circuit and drives, and through a flexible coupling, a 3-kw. exciter for the main generator field. The unit is placed near the boilers.

The rotary unit consists of the motor, rated at 250 hp. at 750 r.p.m., directly connected to the rotary through a special flexible coupling. A 5-hp. motor drives a blower cooling the rotary motor. Special precautions are taken to prevent possibility of explosion as a result of sparks in the motor. The cooling air is supplied to the blower through a duct extending a considerable distance from the derrick.

No. 32 in a series by Joseph Zaba, petroleum engineer, Houston

CAMERON 6 POINT DRILLING CONTRO



With this Cameron drilling *well control* manifold under your derrick floor you can drill *anywhere ...to any depth...* and never look back! Every component unit in this assembly has been proved in the field time after time under the most destructive pressure conditions. In combination they provide the world's most dependable safeguard against the constant threat of blowouts.

Of importance, too, is the fact that this Cameron drilling control manifold *will actually pay for itself* on a few wells... regardless of whether it is called upon to save your rig and well bore when pressures become unruly. Compared with other models, the Cameron Type "QRC" Blowout Preventers save many hours of costly rig time because of their easy, speedy ram change feature. Rams in the largest size "QRC" Preventer can be changed *in a few minutes!*

Consult your Composite Catalog or the nearest Cameron representative for complete mechanical details, or write direct to:

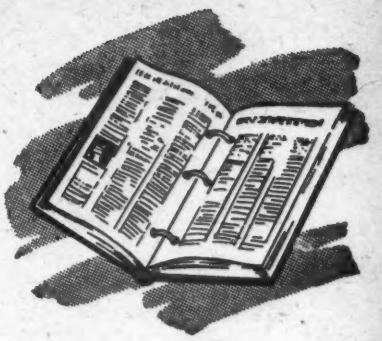
CAMERON IRON WORKS, INC.

P. O. BOX 1212, HOUSTON, TEXAS

Export: 74 Trinity Place, New York, N. Y. West Texas: Midland (Telephone 1982). Oklahoma: 310 Thompson Bldg., Tulsa. California: Long Beach (P. O. Box 267). Wyoming: Casper (P. O. Box 708). North Louisiana: Bossier City (P. O. Box 425).

The Refiner's Notebook

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL



Priming Centrifugal Pumps

THE successful position occupied by centrifugal pumps in refineries today is proof that operators now understand the necessity of a "flooded" suction or an adequate priming system. Centrifugal pumps will not function unless the suction line and case are filled with liquid. Although a centrifugal pump will pump air, the head is so small in terms of pounds pressure (a 200-ft. head of air corresponds to only 3 in. of water) that substantially no suction life occurs. The handling of refinery liquids in open containers for the purpose of priming or filling suction lines is often dangerous.

Venting.—If the pump is installed with a positive suction head (flooded suction) the air is vented from the pump by opening the pet cock on the top of the pump casing. Even during operation, gas or air is sometimes swept into the pump, and it must be vented from time to time. When handling volatile liquids the vent cock is sometimes connected by a closed line to the refinery drain system to prevent exposure to explosive vapors.

Foot valves and evacuators.—These two methods are not used widely in refineries, although they are useful in large power plants or for some main water-supply pumps. Foot valves consist of a large port check valve attached to the end of the suction pipe, so that once the suction line is full of liquid, the liquid cannot drain back to the sump or liquid source. When starting the pump, the suction line is filled through the vent cock or other connection for this purpose from another source of liquid—a tank or small pump. They are not very successful because the foot valve leaks, particularly if the fluid contains sand or suspended material.

Evacuation of the air from the pump and lines by means of steam (water or air) ejectors or a vacuum pump, is a more successful method of priming. It is particularly useful if a large number of pumps, all of which handle much the same type of nonvolatile material, must be primed. All such pumps can be connected (out of the tops of the cases) to a common vacuum system which contains a vacuum pump surge tank and an automatically controlled vacuum pump. Hand-controlled vent valves are provided at each pump, or automatic vent valves can be had which will apply vacuum to a pump whenever venting is necessary.

Priming tanks.—A "flooded" suction is the conventional arrangement in refineries but so-called priming tanks are also used. Refer to The Refiner's Notebook No. 155, (August 2, 1947) for the maximum suction lifts of pumps and the method of computing the suction head or lift. Fig. 1 indicates a priming-tank setup. In this simple setup, a tank is connected to the pump suction and a line leads from the top of the tank to the main supply of liquid. The tank should have a volume of about three times the volume of the suction line, and hence, it is usually set somewhat close to the main tank or sump. When the pump is started, the liquid level in the priming tank is lowered which causes a partial vacuum so that liquid is drawn from the main supply. Upon shutting down the pump, liquid backs up from the discharge line and refills the priming tank. After the liquid has backed up into the priming tank, the inlet and discharge valves of the pump are tightly closed to prevent leaks of liquid from the pump or line, or leaks of air into the system. Automatic systems can be purchased which involve an automatic switch for turning off the pump if the supply of liquid fails, and a discharge tank which insures that an adequate amount of liquid for filling the priming tank is available when the pump is shut down.

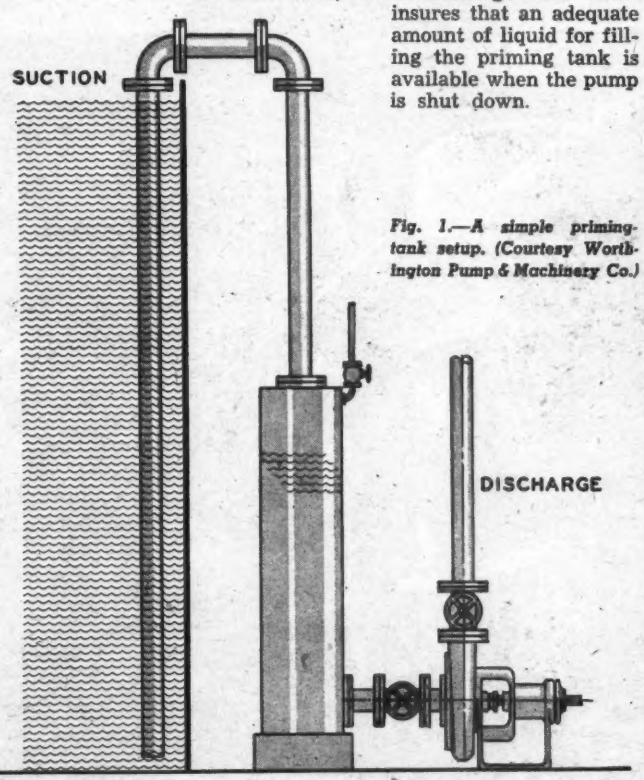


Fig. 1.—A simple priming-tank setup. (Courtesy Worthington Pump & Machinery Co.)

No. 156 in a series by W. L. Nelson, professor of petroleum refinery engineering, University of Tulsa

WHEN IS A TANK CAR NOT A TANK CAR?

The answer: *never!* A tank car is *always* a tank car. But even if all tank cars look alike—as all cats look grey in the dark—there are important differences under the tank car's workaday coat of paint.

In the GATX fleet of 37,000 specialized tank cars, there are 207 types. Designed not just for the fun of it—but for the practical purpose of supplying you, the shipper, with the right car for your particular commodity.

Routing cars from one season to another . . . from one commodity to another . . . from one part of the country to another is part of the job General American does for its customers—the railroads and the shippers. A basic service of those hard-working tank cars with the GATX reporting mark.

GENERAL AMERICAN TRANSPORTATION CORPORATION

135 South La Salle Street, Chicago

DISTRICT OFFICES: Buffalo • Cleveland • Dallas • Houston • Los Angeles • New Orleans
New York • Pittsburgh • St. Louis • San Francisco • Seattle • Tulsa • Washington
EXPORT DEPT.: 10 East 49th Street, New York 17, New York

GATX GENERAL AMERICAN

Impact and Fatigue Tests for Metals

IT can be shown mathematically that a load applied suddenly develops stresses approaching double the value of those caused by the same load applied slowly and steadily. A number of tests have been devised to measure the resistance of steel to blows or impact loads. Most of the testing machines consist essentially of a pendulum which is allowed to fall against the specimen, and a means of measuring the energy required to break the specimen.

Two tests, the Charpy and the Izod, are the most commonly used. The results obtained from one of the tests cannot be converted to values for the other test, nor can the values obtained by either test be correlated with the other physical properties of the specimen. The specimens are usually notched to facilitate breaking, and in comparing impact values, it is vital that tests and specimens be identical, as there are several standard notching designs. Temperature variations have a decided effect on impact values and should be considered when making comparisons.

Fatigue, the "crystallization" of the old-time practical men, accounts for a great number, probably a majority, of failures of moving parts. The endurance limit, or fatigue limit, of a steel has been defined as the stress, in pounds per square inch, to which the material may be subjected an infinite number of times without failure. For rolled and heat-treated steels, the endurance limit is usually about 50 per cent of the ultimate strength, while for cast steels the value declines to about 40 per cent of the ultimate strength.

To make a fatigue test, a small beam specimen is put into a machine that will rotate the specimen while it is under transverse load, either as a cantilever or end-supported beam. As the beam rotates, the stress in each fiber is alternated from tension to compression and back to tension at each revolution. The maximum stress under which the beam can rotate indefinitely without breaking is the endurance limit. In practice, 10 million revolutions at a rate of 1,750 r.p.m. is considered adequate to establish "indefinitely." A corroding medium, such as a salt-water spray, will reduce the endurance limit to a value known as the corrosion-fatigue limit.

Reduction in area.—This term is a measure of the ductility of the material. It is the difference between the least cross-sectional area after rupture (not necessarily the area of the fracture) and the original area, expressed as a percentage of the original area.

Compression tests rarely are made on steel. Ductile material, such as mild steel, has no true ultimate compressive strength because the test piece will continue, after the elastic limit is reached, to change shape with increased loading without fracturing. Hard and brittle steel develops compressive stresses very similar to those in tension. Failure is usually by shearing or splitting along one or more planes diagonal to the loading. For most steel-design work, values for the elastic limit, yield point, ultimate strength, and allowable working stresses are assumed to be the same in either tension or compresion. For shear, however, 75 per cent of the tensile values is commonly used.

Sometimes, torsion tests are made on steel. They are similar to tensile tests, except, of course, that a twisting force is substituted for a pull, and the amount of twist, usually expressed as an angle per unit of length of the specimen, is measured instead of the stretch. The modulus of elasticity of steel in torsion is less than half its value in compression or tension. A generally accepted value is 12,000,000 psi.

Bending tests are useful and generally easy to make. The bend test has the advantage of testing the specimen in tension, compression, and shear simultaneously. There are any number of bending tests that may be made, each applicable to some particular condition of service. Structural members, such as I-beams, usually are tested by measuring the deflection caused by a load applied to the center of the test piece, the end of which are supported. Rivets, bolts, rods, etc., may be tested by cold bending a specified number of degrees, usually 90° or 180°, around a pin of a given diameter. It is not necessary to measure the load, since the only criterion is whether or not cracks are developed in the bent portion during the testing. A special application of the bend test is the flattening test for A.P.I. pipe. In this test, a piece of the pipe, not less than 2½ in. long, is pressed between parallel plates until the distance between the plates reaches an arbitrary limit, which depends upon the diameter, thickness, and grade of the test piece. The pipe passes this test if the specimen does not develop any cracks or breaks prior to the plates reaching the specified limiting distance apart.*

Other Tests

There are many other physical tests that can be made on steel. These include high and low-temperature tests of many of the properties mentioned in the preceding paragraphs. One of the most important of these tests is the creep test, which determines the creep strength, or maximum stress that can be applied at a given temperature without causing a specified elongation to be exceeded within an allowable time limit.

Corrosion tests may be made for many different types of service. When a choice of material is possible, these tests are useful in forecasting the probable length of service of each of the various materials that can be used in selecting the one that is best fitted for the job. The corrosion tests, due to their nature, cannot be too well standardized, and particular care should be exercised in making comparisons of results. Two common expressions for the results of corrosion tests are the per cent loss of weight undergone by the test coupon during the test, and the corrosion penetration or pitting rate, measured in inches per year.

Magnetic tests, or inspections, magnaflux method, in which powdered iron is blown onto the magnetized specimen and anamolies in the magnetic field noted, and the search-coil method, of which the Sperry-Sun rail tester is a good example.

Unrelieved temperature or working stresses may be found by the X-ray tests. The X-ray is especially useful in testing welded pressure vessels.

*Section IV, A.P.I. Standard 5-A.

Series reported by H. N. Lyle, district engineer, Corpus Christi, Seaboard Oil Co. of Delaware

PETRECO Electric DESALTING

INCREASES REFINING EFFICIENCY

When salty crudes are charged

TOWERS	⇨	Clean bubble caps and trays,–better fractionation.
EXCHANGERS	⇨	Salt plugging eliminated,–improved flow, reduced pressures.
VIS-BREAKER	⇨	Harder cracking with less coking.
FURNACE	⇨	Longer runs at higher temperatures.
SLOP OIL	⇨	Economical disposition available.
TANK BOTTOMS	⇨	Metered through desalters and salvaged.
FUEL RESIDUUM	⇨	Cleaner,–salt in fuel oil minimized.
PRODUCTS	⇨	Gasoline: lead susceptibility often improved. Asphalt: solubility increased, viscosity lowered, spot tests improved.

PETROLEUM RECTIFYING COMPANY

5121 South Wayside Drive, Houston 1, Texas
648 Edison Building, Toledo 4, Ohio
530 W. Sixth Street, Los Angeles 14, Calif.

PETRECO

SPECIALIZED *Electric* PETROLEUM PROCESSES { **DESALTING** **DEHYDRATING**

PB 47-N

REFINING

Texaco Lets Contracts For Philadelphia Plant

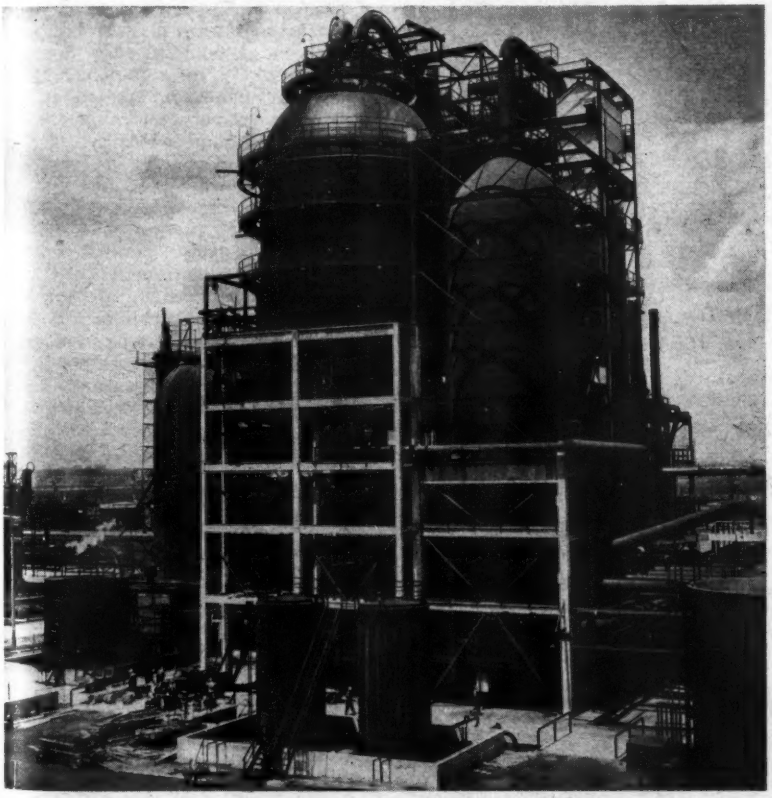
NEW YORK.—Contract for the construction of the 42,000-bbl. daily crude and vacuum-distillation unit at The Texas Co.'s new refinery in the Philadelphia-Camden, N. J., area has been let to Foster Wheeler Corp., The Texas Co. announced last week.

Another contract for the Fluid catalytic cracking unit at this plant has been closed with M. W. Kellogg Co. Units not yet contracted for include a solvent-extraction unit, power plant, tankage, and docks to serve the refinery. Three 7,500-kw. turbogenerators have been bought from Westinghouse Electric Corp. Contracts for dredging and for site clearing have been let to Gahagan Construction Corp., E. H. Ellis & Sons, T. A. Reilly Co., and Brokaw Land Clearing Co. About 2 years will be required to complete the refinery.

Shell Enlarging West Coast Ammonia Plant

Capacity of the synthetic-ammonia plant of Shell Chemical Corp. at Shell Point, near Pittsburg, Calif., will be increased 50 per cent within the next 12 months.

J. Oostermeyer, president, said the plan for increasing ammonia-producing facilities is in keeping with the continued need for the product in the manufacture of fertilizer, and explosives, in wood pulp processing, and in the refining of beet sugar and petroleum.



After a planned initial run of 9 months, the 23,000-bbl.-per-day Fluid catalytic cracking unit at the Philadelphia refinery of Gulf Oil Corp. recently experienced its first turnaround. Every major vessel was entered and thoroughly inspected, and most exchanger bundles were pulled to serve as an indication of current wear and what might be expected during the next year's operation. The unit was found in excellent condition, and the turnaround proved very economical from a labor standpoint. Approximately 360 men were employed on the unit during its turnaround without a single lost-time accident. The Gulf refinery has a crude capacity of 68,000 bbl. per day and a total rated cracking capacity of 46,000 bbl.

June Lubricating Oils Output Shows Decrease

Production of lubricating oils in the Mid-Continent showed a decrease during June, according to the summarized operations of 13 companies reported by the Western Petroleum Refiners Association.

Production of bright stocks dropped from a daily average of 9,129 bbl. in May to 8,258 in June. June production in other classifications compared to that of May was: viscous neutrals. 16,854 bbl. daily against 17,258; paraffin oils, 2,907 against 2,518; steam refined stock, 1,030 against 1,186; and blended oils, 17,641 against 17,689.

Jefferson Chemical Plant Begins Initial Operations

Operation of some parts of the new Jefferson Chemical Co., Inc., plant at Port Neches, Tex., was scheduled to start last week.

Water-treating equipment was being circulated, and it was planned to start drying out the boilers in the very near future. Start up of other units will follow as fast as construction permits, according to A. A. Triska, plant manager.

Until recently material deliveries have been the main bottleneck. However, this difficulty has been overcome, and the only factor delaying construction at the present time is the inability to obtain a sufficient number of electricians, pipefitters, and particularly pipefitter welders, Triska said.

Synthetic Oils Described

Properties, chemical composition, preparation, and blending of three synthetic oils developed during the war to provide improved lubricants for Navy aircraft instruments are dis-

INDUSTRIAL
OIL AND GAS
BURNING
EQUIPMENT
NATIONAL AIROIL
BURNER CO., INC.
1236 E. Sedgley Ave., Philadelphia 34, Pa.

cussed in a report now available from the Office of Technical Services, U. S. Department of Commerce. The oils, two of the spreading type and one nonspreading, were developed at the Mellon Institute for Industrial Research, Pittsburgh.

Standard Refinery Sets Record Turn-Around Time

Production loss of 3,000,000 gal. of gasoline and 2,500,000 gal. of heating oils was avoided at the Linden, N. J., refinery of Standard Oil Co. of New Jersey with completion of an overhauling job on the refinery's 20,000-bbl. daily catalytic cracking unit in the record time of 2 weeks.

The turn-around time was a week shorter than that of any previous servicing job.

Refinery Superintendent J. R. Eiffe said 360 workmen representing 17 crafts completed more than 200 separate repair jobs on the unit in the 14-day period. Work was speeded by installation of a public-address system to improve coordination, and a sound-power telephone system to provide closer contact between foremen and engineers.

Deasphalting Unit Finished

The wax division of Petrolite Corp., Ltd., has announced the completion of a new propane deasphalting unit at its Kilgore, Tex., refinery. The new unit, licensed by M. W. Kellogg Co., was constructed by Koch Engineering Co. of Wichita, and will augment Petrolite's production of high-melting-point microcrystalline waxes.

Fluid Units Now Building To Add 225,000 Bbl. Daily

Fluid catalytic cracking process installations now being completed by M. W. Kellogg Co. for leading refiners will mean a net increase in cracking capacity of 225,000 bbl. daily to the industry.

H. R. Austin, president, said that this will bring the total capacity of Kellogg-engineered units completed since 1940 to 700,000 bbl. daiy.

The company also has foreign installations under construction. These include two propane deasphalting units at Haifa, Palestine; several large projects in Canada; and a large number of processing facilities, including fluid catalytic-cracking at Amuay, Venezuela.

Benzonitrile Produced on Semicommercial Basis

NEW YORK.—Production of benzonitrile on a semicommercial basis has been announced by Socony-Vacuum Oil Co., Inc., officials. A large pilot plant has been erected at the company's refinery in Paulsboro, N. J., and pilot-plant quantities of this versatile chemical will be supplied to laboratories and plants in the oil and chemical industries.

Wide use of the material is expected by company scientists, due to its especially high reactivity with a great number of chemicals for the synthesis of rubber chemicals, resins, plastics, dyestuffs, and pharmaceuticals. Its application in these fields heretofore has been handicapped seriously by lack of adequate quantities for commercial needs.

The process utilizes toluene and ammonia, industrial large-scale production of both of which increased manyfold during World War II. With a suitable catalyst, the nature of which has not been disclosed, the benzonitrile, C_6H_5-CN, is formed by removal of three hydrogen atoms each from toluene and ammonia:

C_6H_5-CH_3 + NH_3 + (catalyst) = $3H_2$ + C_6H_5-CN + (catalyst).

Socony-Vacuum scientists developed the required catalyst after long and intensive research. The product is a high-boiling, water-insoluble liquid, b.p. 375° F., freezing point of 9° F., and weighs 8.35 lb. per gallon, or essentially the specific gravity of water (8.342 lb. per gallon). Its odor is that of bitter almonds, and it is soluble in organic solvents such as alcohols, CCl_4, and ether. It is considered probable that it has good insecticidal properties, and is a good solvent for vinyl resins, etc.

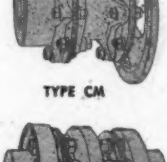
THOMAS ALL METAL Flexible COUPLINGS

SPECIFIED WHEREVER 100% DEPENDABILITY IS DEMANDED

Refiners specify Thomas "Flexible" Couplings for PUMPS, COMPRESSORS, COAL PULVERIZERS, COOLING TOWERS and GENERATOR SETS.

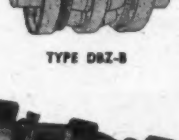
TYPE DBZ-C

Pipe Line Men know that Thomas "Flexible" Couplings on their Low or High Speed Pumps give 100% dependable service.



TYPE CM

Drilling Engineers get the most out of their equipment with Thomas "Flexible" Couplings on Engine, Gear and Mud Pump Drives.



TYPE DBZ-B

In the Laboratory Thomas "Flexible" Dynamometer Couplings assure the greatest accuracy.

TYPE DBZ

Thomas Flexible All-Metal Couplings Have No Wearing Parts. BACKLASH, FRICTION and CROSS-PULL ARE ELIMINATED.

NO LUBRICATION IS REQUIRED!

Write for the new Engineering Catalog

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

PIPE LINES

Interstate Forms Unit To Begin Air Patrol

INTERSTATE OIL PIPE LINE CO. has announced the formation of an aviation unit which will soon begin regular air patrol of its main trunk line systems and lines of the Ajax Pipe Line Corp.

To start around September 1 when personnel involved have completed an intensive course of training and orientation, the unit will patrol Interstate lines in Oklahoma, Arkansas, Louisiana, and Mississippi, and the Ajax line from Glenn Pool, Okla., to Wood River, Ill.

Patrol activities will require the use of three planes, the last of which was delivered on July 31. Two of these will be based in Tulsa; the third will operate out of Baton Rouge, La.

The aviation unit, which will also operate the company's twin-engine executive transport, is headed by Chief Pilot F. T. Pipkin and includes four pilots and an aircraft and engine mechanic.

Under present plans, each of the three planes will spend 4 days in the air on regular patrol work, an average of about 1,500 miles per week. One plane will cover Interstate's Oklahoma system and the Ajax line from Glenn Pool to Wood River. The second will patrol the trunk line from Glenn Pool to Baton Rouge and Interstate's Mississippi system. The third plane, based at Baton Rouge, will fly over the company's lines in the bayou and delta lands of South Louisiana.

Communication between pilot and ground personnel will be maintained by means of signal panels on the ground and dropped messages. A letter code has been arranged by which a variety of messages and instructions can be relayed to the pilot.

Wartime English Channel Lines Being Salvaged

Two ships are engaged in removing 13 H.A.I.S. lead cable pipe lines across English Channel; 2 Isle of Wight, Cherbourg, 65 miles each, and 11, Dungeness-Bologne, 30 miles each. In addition, there are 8 Hamel steel channel lines to be removed later. Some H.A.I.S. lines were found to be overlaid by wrecked ships and Hamel pipe lines.

To facilitate coiling of H.A.I.S. cable pipe in unloading at the quay at Southhampton, gantry scaffolding with sheaves was installed. Four coils, each 50 ft. in diameter and 15 ft. high, representing 30 miles of cable pipe, have been stacked.

Although the H.A.I.S. pipe was washed with water before removing from the channel, more than 65,000 gal. of high-octane gasoline have been pumped out of recovered pipe through special connections. The H.A.I.S. pipe

Lifting cable pipe line across English Channel for salvaging operations

"Everything for the Pipeliner"

PIPE COATING and WRAPPING MACHINES
Stationary and Line Traveling

PIPE CLEANING and PRIMING MACHINES
Stationary and Line Traveling

American Steel Works
HEATING KETTLES

PIPE LINE SUPPLIES AND EQUIPMENT

PERRAULT Brothers INC.
1130 NORTH BOSTON
TULSA 6, OKLAHOMA
Phone 5-1104

MB

CONTRACTS LET!

Yes, contracts let to Morrison Bros. are contracts fulfilled with . . . new and modern equipment, operated by efficient and ample personnel, directed by an organization with the ability to get the job done and done right. "A contract with MB means Pipeline Perfection!"

MORRISON BROS. CONSTRUCTION CO. INC.
P. O. Box 4106 - Odessa, Texas - Phone 1640

is to be cut in 6-ft. lengths for lead-recovery operations, according to the British publication, the Engineer.

Preliminary Work Starts On West Texas-Cushing Line

Preparatory work has already begun at Midland, Tex., for the big-inch line to be built by Texas Pipe Line Co., Shell Pipe Line Corp., Sinclair Refining Co., and Empire Pipe Line Co. The name for the undertaking has not yet been announced.

The current work at Midland consists of preparing grades for 322,000-bbl. crude-oil storage tanks which are to be erected 3 miles east of Midland.

Clearing for the location of a pump station at Jal, N. M., has also been started where four 122,000-bbl. tanks and a pump station will be built. The Jal station will adjoin the Texas-New Mexico Co.'s pipe-line station.

Delivery of some of the pipe for the line is expected to start in September. Laying operations are to commence in October. Initial operating capacity is to be 144,000 bbl. with the pump stations installed at the beginning of the project.

Humble Formally Opens Terminal at Hearne

Humble Oil & Refining Co. held ceremonies July 29 at the opening of the delivery terminal for the products pipe line located near the crude-oil pump station of Humble Pipe Line Co. at Hearne, Tex.

The ceremony was attended by R. B. Hanrahan, president, Humble Pipe Line Co.; H. W. Ferguson, refining director, and Frank A. Watts, sales manager of Humble Oil & Refining Co.

Construction in Illinois Area

Midwestern Contractors, Inc., Chicago, has just completed meter and regulator stations at Marengo and McHenry, Ill., for Natural Gas Pipeline Co. of America.

This firm has completed 5 miles of 8-in. gas line for Western United Gas & Electric Co. from McHenry meter station to Crystal Lake and is now working on 9 miles of 12-in. gas line for this company south of Downers Grove, Ill.

Several small-diameter 2 to 10-in. lines have been laid by Midwestern Contractors for Public Service Co. of Northern Illinois near Chicago. Midwestern Contractors is now working in towns west and south of Chicago.

For Chicago District Pipeline Co. several 20 and 24-in. gate valves and headers have been installed. Casing at highway and railroad crossings is now being installed preparatory to laying 19 miles of 24-in. gas line between Joliet, Ill., and Chicago, to be started in August.

Midwestern Constructors, Inc., Tulsa, is laying approximately 5 miles of 10¾-in. pipe for Wierton Steel Mills, Wierton, Ohio. This includes 1,000 ft. for an Ohio River crossing. Work will be completed about August 15. Midwestern Constructors does the work as a subcontractor for the contractor, J. R. Savage. Midwestern's superintendent is Whitey Weller.

Colorado-Wyoming Gas To Lay 450-Mile Line

Colorado-Wyoming Gas Co. will begin construction of a $1,542,450 8-in. natural-gas line from Denver to Cheyenne as soon as materials are available, W. L. Thackrey, manager of the company, has announced.

Lone Star Building 35-Mile Natural-Gas Pipe Line

Lone Star Gas Co. has construction under way on a 35-mile, 6-in. gas pipe line from its 8-in. system 1 mile northeast of Miles, Tex., to the Eden gas field in Concho County, West Texas.

The line will tap, for Lone Star Gas Co., three wells of Northern Ord-

WRITE FOR LATEST INFORMATION

TYPE SG CONTRACTORS' PIG

REMOVES DIRT and OBSTRUCTIONS DURING PIPE LINE CONSTRUCTION

- Air-propelled by portable compressors.
- Cleans 3 to 5 miles at a time.
- Stellite-edged sizing plate on front end insures proper dia. of pipe throughout.
- Replaceable rubber scraper cups remove dirt and obstacles before line is filled initially.

Type SG 3" to 14"—Type LG 16" and Larger
Refer to Dept. J

THE PIG WITH THE POKE CLEANS PIPE LINES
T. D. WILLIAMSON, Inc.
TULSA, OKLA.

THE SIGN OF RELIABILITY

McVEAN & ROBERTS CONSTRUCTION — M&R PIPE LINE

"The spirit that animates and keeps up society is mutual trust," is a wise observation that a famous man once said; but that trust must be earned by those who are trusted. Through years of trustworthy service to the petroleum industry, McVean and Roberts have made their trade mark mean "The sign of Reliability." This sign has come to mean a pipeline construction company who can get the job done right and as contracted.

McVEAN & ROBERTS

ODESSA, TEXAS
BOX 2607
TEL. 1591

FT. WORTH, TEXAS
501 RIVERSIDE DRIVE
TEL. 3-4100

EXCEL-SO

The original separator/filter guarantees maximum performance with minimum servicing of pipeline equipment by delivering petroleum products 99.999% water free while eliminating debris and microscopic iron solids from product streams.

● Write for Additional Information

WARNER LEWIS COMPANY
(FLOTROL SYSTEMS INC.)
BOX 3096 • TULSA, OKLAHOMA

nance, Inc., which have open-flow daily potentials aggregating 70,000,000 cu. ft. of gas. Capacity of the new line will be approximately 6,000,000 cu. ft. a day. Construction is by Ladwig Construction Co., Corpus Christi, Tex., and completion is scheduled for September 1.

Frequency Allocations On Cooperative Basis

Regional coordinating groups have been formed throughout the country to coordinate the allocation of radio frequencies to pipe-line and utility companies authorized radio use in their business by the Federal Communications Commission.

The policy of direct coordination at local levels was agreed upon at a joint meeting of representatives of the power utilities and pipe-line operators recently in Chicago.

Under the plan, the regional groups will promote cooperation among operators in selection of operating frequencies to avoid interference. It is understood the FCC will request future license applicants to secure first a recommendation from the appropriate regional coordinating group.

Area covered by each group organized thus far and the committee member to be contacted on frequency-assignment matters follow:

New England: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut. W. C. Phillips, New England Power Service Co., Boston.

Middle Atlantic: New York, New Jersey, eastern Pennsylvania, Delaware, Maryland, and District of Columbia. C. S. Young, Pennsylvania Power & Light Co., Allentown, Pa.

North Central: Western Pennsylvania, Ohio, West Virginia, Indiana, Illinois, Michigan, Wisconsin, and Kentucky. J. G. McKinley, West Penn Power Co., Pittsburgh.

Southwest: Iowa, Missouri, Nebraska, Kansas, Oklahoma, and Arkansas. H. W. Chew, Empire District Electric Co., Joplin, Mo.

Texas: Paul Taylor, Central Power & Light Co., Corpus Christi.

North: North Dakota, South, Dakota, and Minnesota. M. K. Patterson, Minneapolis Gas Light Co., Minneapolis.

Great Lakes Sells Pipe To Three Companies

The 120 miles of 6 in. being taken up by A. C. Holder Construction Co. between Oscola, Iowa, and Omaha, Neb., was previously replaced by Great Lakes Pipe Line Co. in its program to standardize on 8-in. pipe for such lines. *(The Oil and Gas Journal, July 19, page 111.)*

Of this 120 miles of 8-in., Sunray Oil Corp. has bought 90 miles; Mid-Continent Pipe Line Co. 12.2 miles, and Cities Service interests, 27.8 miles. At the beginning of this week, approximately 10 miles have been removed. The contractor is using special methods which he has developed for such salvaging operations.

CORROSION PREVENTION

● These protective materials for all types of structures, above and below ground, have been proved by years of service to effectively prevent corrosion under most severe conditions. Order them for your next job.

BITUMASTIC

● Hot applied pipe line coating.
● Cold applied coating and paints.

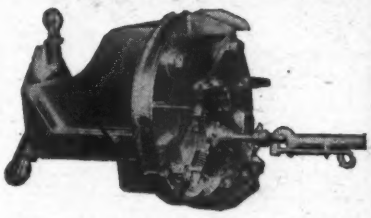
Carey

● Asbestos pipe line felt.

These corrosion prevention products are distributed in Texas and Louisiana by:

James E. MAVOR
514 M & M Building Capitol 2203
Houston 2, Texas

SUPERIOR INSIDE LINE-UP CLAMP



The right answer to the "big inch" pipe alignment problem is now available!

• MORE PRODUCTION
• EFFICIENT WIRE BRUSH SWAB
• TRUE ALIGNMENT
• NOW IN USE BY MAJOR PIPE LINE COMPANIES AND CONTRACTORS

●

AVAILABLE FOR RENTAL
PIPE SIZES 12" THROUGH 28"

●

True pipe alignment with greater speed means a better pipe line for the owner—more profit for the contractor.

SUPERIOR
WELDING & MACHINE CO.
P. O. BOX 87 PHONE 161
BARTLESVILLE, OKLA.

NATURAL GAS

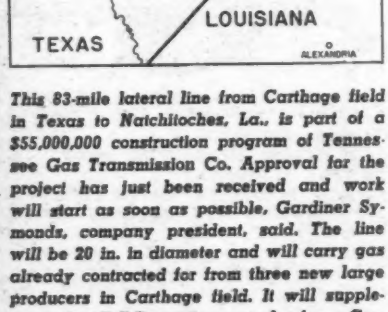
United Natural's Plans For Inch Tap Approved

WASHINGTON.—The Federal Power Commission has authorized United Natural Gas Co. to construct approximately 71 miles of 20-in. natural gas pipe line in Pennsylvania to take gas from the Big and Little Big Inch lines.

Authorization is without prejudice to any findings or orders which may be made by the commission concerning Texas Eastern Transmission Corp.'s application to operate the Inch lines for gas transmission, FPC said.

Cost of construction was estimated by the company at $3,307,131. Evidence introduced at a public hearing recently in Washington indicated the company is in need of additional gas to replace depleting local sources and to enable it to meet present and future requirements of its customers, FPC said.

The new line will extend from the south end of United's 12-in. line in Franklin Township, Beaver County, to a connection with the Big and Little Big Inch system in Rich Hill Township, Greene County.



This 83-mile lateral line from Carthage field in Texas to Natchitoches, La., is part of a $55,000,000 construction program of Tennessee Gas Transmission Co. Approval for the project has just been received and work will start as soon as possible, Gardiner Symonds, company president, said. The line will be 20 in. in diameter and will carry gas already contracted for from three new large producers in Carthage field. It will supplement the T.G.T. system supply from Carthage already moving via another lateral line that ties in at Monroe, La. Other projects in the construction program include a new aerial crossing of the Mississippi River near Greenville; a new compressor station in Nueces County, Texas; 491.5 miles of 26-in. loop, 68.7 miles of 24-in., and 82.4 miles of 20-in. loop on the main line east of Natchitoches

Hope Natural Granted Project Authorization

WASHINGTON.—Hope Natural Gas Co. has been authorized by the Federal Power Commission to construct and operate natural-gas facilities in West Virginia to enable the company to receive an additional 50,000,000 cu. ft. of gas a day and increasing to 165,000,000 cu. ft. per day Hope's capacity to take gas from Tennessee Gas Transmission Co.

The cost of the facilities has been estimated at $3,004,507. They include installation of four 1,000-hp. compressor units together with auxiliary equipment and buildings at its Cornwell compressor station, 31 miles of 16-in. loop paralleling an existing line and commencing in Gilmer County, West Virginia, and extending to a point about 16 miles south of Hastings compressor station, and a booster station aggregating 6,000 hp. in Doddridge County.

Pennsylvania Project Given State Approval

The Pennsylvania Public Utilities Commission, in a 3 to 2 decision, has approved construction of a $5,000,000 natural-gas pipe line by Manufacturers Light & Heat Co.

The project calls for construction of a 125-mile, 14-in. line from near Coatesville to the New York state line at Port Jervis, N. Y. The company is a subsidiary of Columbia Gas & Electric Corp.

Temporary Permit Given Central Kentucky Natural

WASHINGTON.—Central Kentucky Natural Gas Co. has been temporarily authorized by the Federal Power Commission to construct and operate facilities to deliver additional natural gas to Cincinnati Gas & Electric Co. and Union Light, Heat & Power Co. to meet estimated peak-day requirements particularly for the coming winter.

Estimated to cost $1,933,000, the facilities include 23.2 miles of 24-in. gas line from near Foster, Ky., to a point on the Ohio River near Brent, Ky., and multiple crossings of the Ohio River to connect with lines of the Cincinnati company. Central Kentucky was also authorized to construct a new measuring station at Cold Springs, Ky.

Continued Rise Shown in June Natural-Gas Sales

Sales of natural gas in June rose to 1,847,537,000 therms, a gain of 8.9 per cent over June 1946, and the index of natural-gas sales stood at 208.3 per cent of the 1935-39 average.

The American Gas Association's monthly report also showed that sales of natural gas for the 12 months ended June 30 were 9.5 per cent over the year-earlier period and totaled 24,428,630,000 therms. All gas-utility sales during June totaled 2,110,831,000 therms, 8.7 per cent over June 1946, A.G.A. reported (one therm equals approximately 95 cu. ft. of natural gas).

Natural Gasoline

Anchor Asks Permit To Buy Lewisburg Gas

Anchor Gasoline Co., Tulsa, has applied to the Louisiana Conservation Commission for permission to purchase natural gas from Lewisburg field, in Acadia and St. Landry parishes, at 4½ cents per M.c.f. In its application, Anchor outlined a proposed expansion program costing approximately $500,000, pending favorable action by the commissioner.

Joe R. Wright, Anchor chief engineer, said the contemplated operations would include construction of a 6-in. pipe line from Lewisburg, north to the company's plants at Eola and Cheneyville, La., at a cost of about $265,000. These plants would be altered, at a cost of $84,000, and a $210,000 plant near Church Point, La., would be constructed to extract distillate from the gas.

Disposition of the gas would include 1,500,000 cu. ft. daily to the Louisiana Ice Co. at Bunkie, La., and the remainder to be processed at the Eola and Cheneyville plants, for oil lift in the adjoining fields, then reprocessed and the residue sold to Southern Carbon Black Co. at Eola.

Plant Contract Awarded

Refinery Maintenance Co., Inc., has been awarded a contract to build the recycling plant for Western Natural Gas Co., which recently purchased 8,000 acres of producing leases and 16,000 acres of wildcat acreage in Live Oak and Bee counties, Texas, from Henderson Coquat.

Exploration and Drilling

Goliad County Strike

SUNRAY OIL CORP. appears to be in process of opening up a new dual-pay field in the Wilcox trend in the north corner of Goliad County, Texas. Sunray's 1 George A. Brandt, in the Thomas Hancock Survey, about 1 mile north of the old Weser field, looks like a good gas producer in the Reklaw sand above the Wilcox, and an oil producer in the Luling sand of the Wilcox.

The Luling-sand oil prospects look excellent, based on drill-stem test results. After coring oil sand from 7,709-15 ft., a drill-stem test was run on same interval. With a 500-ft. water cushion, ¼-in. chokes, 130-psi. maximum working pressure, it started flowing 4 minutes after the tool was closed, flowed oil for 70 minutes, recovering 1,220 ft. of 31.4°-gravity clean oil, bottom-hole pressure being 3,050 psi. flowing at 3,375 psi. shut in.

A second core at 7,715-25 ft. recovered sand with streaks of shale and oil shows. A drill-stem test of this interval, ¼-in. chokes, 500-ft. water cushion, 62-psi. maximum working pressure, recovered the water cushion, 4,135 ft. of oil, and 215 ft. of salt water. Bottom-hole pressures were 3,525 psi., both flowing and shut in.

Before attempting completion, the well was drilled to a total depth of 8,513 ft. to test the Machant and Massive sands, but found nothing. The Massive was topped at 7,810 ft. (The Massive sand here is a basal Eocene Tertiary pay, not to be confused with Massive pay in the Tuscaloosa Cretaceous of Mississippi and Louisiana). The Slick sand which sometimes pays off in the Wilcox trend, and lying below the Luling, was absent in this test.

Pipe has been set at 7,770 ft. and first completion attempts will be made through perforations opposite the Reklaw sand section at 7,430-84 ft., where both side-wall cores and electric log indicate good gas prospects. Following this, a dual completion will be tried in the Luling oil pay. The old Weser field, which lies about a mile south of the discovery, produces from the Cook Mountain sand around 5,200 ft.

SOUTH LOUISIANA

World's Deepest Production In Zone at 13,879-904 Ft.

NEW ORLEANS.—The world's deepest producer has been completed by The Texas Co. in the Queen Bess Island area of Jefferson Parish. Its 1 Lafourche Basin Levee District, 30-20s-25e, approximately 1½ miles west of the No. 1 State gas discovery at East Barataria field, was drilled to a total depth of 15,523 ft., and cemented 5½-in. casing at 13,998 ft. Peforations were made at 13,879-904 ft. for the completion. On an initial test the well gaged 43 bbl. of condensate per day through a 3/16-in. choke, with 4,400 psi. on tubing, with an estimated gas flow of 6,100,000 cu. ft. per day. The previous record for deep production was held by Shell Oil Co., Inc., in its 3 Smith-State Unit 1 at Weeks Island in Iberia Parish, which products 33°-gravity oil from 13,867-873 ft. and 13,878-888 ft., with total depth of hole 14,397 ft. The Texas Co. announced that operations will get under way soon for another well in the area.

Presently there are six active wildcat tests in the Gulf of Mexico and all are drilling or building the location. In Terrebonne Parish, Magnolia Petroleum Co. is driving piling on two ventures. The 1 Ship Shoal, Block 72, Lease 766, located approximately 8 miles south of Coon Point production, is driving piling for a scheduled 13,500-ft. test. The 1 South Pelto, Block 11, Lease 791, is located 10 miles south of Lake Pelto field production and will be a shallow test to the 1,200-ft. level. Stanolind Oil & Gas Co. is waiting on piling prior to starting its 1 State, Lease 757, Tract 752, Block 38, which is in the Coon Point area and will go to 13,000 ft. In Lafourche Parish, Stanolind is drilling 12,830 ft. in 1 State, Lease 739, Tract 884 in the Timbalier Bay area on a projected depth of 13,500 ft. In Vermilion Parish, 22 miles south of Fresh Water Bayou field, Superior Oil Co. is building platform for 1-A Gulf of Mexico. This test is located 19 miles west of the shore line out in the Gulf of Mexico, and will be drilled to 12,000 ft. level.

Magnolia Petroleum Co. 46 Cameron Meadow Land Co., on the south flank of Cameron Meadow field, Cameron Parish, has been completed in a possible new sand. Total depth is 8,920 ft. in a sidetracked hole, with 7-in. oil string set at 8,920 ft. On official gage, the well flowed 114 bbl. of 41.5°-gravity oil through 7/64-in. choke with 3,240 psi. pressure on the tubing, gas-oil ratio 4,979. Production is through perforations at 8,834-36 ft. Magnolia 45 Cameron Meadow Land Co., which is a new deep sand discovery for the south flank of Camerson Meadow field, produces gas and condensate from sands at 8,686-96 ft.

The 22 new locations reported this week included only one wildcat start in Cameron Parish. There were seven completions, four oil and three dry including two wildcats, one each in Assumption and St. Martin parishes.

SOUTH LOUISIANA WILDCAT FAILURES

Assumption Parish: Falcon Seaboard Drlg. Co. et al 1 Williams Cypress Bayou Platten area, 39-14s-14e, 7 mi. E of West Lake Verret field, dry, TD 11,501 ft.

St. Martin Parish: Humble Oil & Refg. Co. 1 St. Martin Parish School Board, Little Bayou Long area, 7½ mi. NW of West Lake Verret field, dry, TD 12,492 ft.

CALIFORNIA

Three Los Angeles Basin Tests Near Completion

LOS ANGELES.—Results of three highly interesting tests in Los Angeles Basin should be known within the next few days. All three wildcats have been attracting considerable attention during the past few weeks and have now reached stages where a few more days will tell the story of whether or not they will be successful. Foremost of the tests is the Basin Oil Co. 1 City of Inglewood, 23-2s-14w, where operators are now gun-perforating casing opposite oil showings encountered at 9,705-10,563 ft. A previous formation test of this interval showed considerable gas and oil, but operators cored ahead at 10,590 ft. Nothing of interest was encountered below the 10,563-ft. level, however, and operators have backed up for a conclusive test of the oil showings.

In the new Alondra area, which now contains two producing wells, British American Oil Co. is preparing to run 7-in. casing at the 1 Park Community, 22-3s-14w, a well whipstocked under the park area. Total depth is now 9,238 ft. Several wells have been drilled in this area, but only two have been successful. The 1 Park Community is being watched with considerable interest as it may reveal important information as to the conditions of the new reservoir.

The third test, in the West Newport area of Orange County, Amerada Petroleum Corp. 36-7 Farnsworth, 7-6s-10w, has been bottomed at 5,900 ft. and operators are now taking side-wall samples prior to running casing. The 36-7 Farnsworth is approximately 1 mile from other production and may mark up an important extension for the West Newport field.

Although Seaboard Oil Co.'s wildcat venture in the Lawndale area of Los Angeles County, the 1 Johnson, 17-3s-14w, has been drilled as a "tight hole," it apparently has uncovered something of interest since Seaboard announced location for an offset test during the past week. The offset will be known as the 2 Johnson, and it will be located in the same section as the original venture. The 1 Johnson, now bottomed at 8,026 ft., is supposedly in Schist and is credited with having blown both oil and gas during a recent formation test. The test was made through perforations in 330 ft. of blank 7-in. cemented on bottom.

New locations announced in California during the past week remained at a high level, although they showed a decrease of 2 from the total of 54 announced during the previous week. Leading in new work

Increase RESERVES AND PROFITS BY

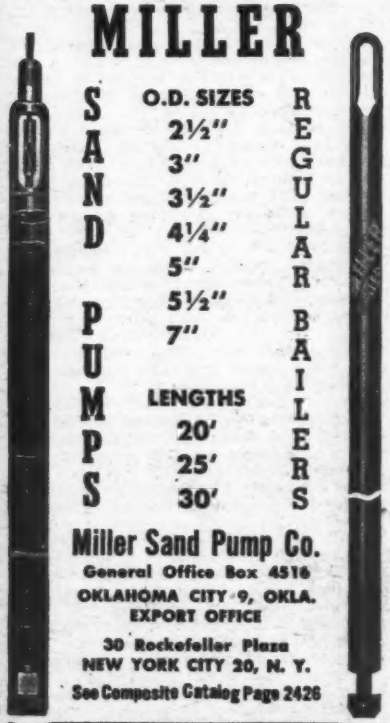
Secondary Recovery

EXPERIENCED PRACTICAL CONSULTING
REPRESSURING AND WATER FLOODING
PRODUCTION ENGINEERING SERVICE

- Preliminary Surveys
- Gas Measurements
- Bottom Hole Pressure
- Compressor Plants
- Installation
- Water Treating Plants
- Core Analysis
- Estimate of Results
- Valuations
- Supervision

PETROLEUM ENGINEERS
CABLE & STINE
WICHITA FALLS, TEXAS

INCREASE PRODUCTION
Clean Out With
MILLER



SAND PUMPS

O.D. SIZES	LENGTHS
2½"	20'
3"	25'
3½"	30'
4¼"	
5"	
5½"	
7"	

REGULAR BAILERS

Miller Sand Pump Co.
General Office Box 4516
OKLAHOMA CITY 9, OKLA.
EXPORT OFFICE
30 Rockefeller Plaza
NEW YORK CITY 20, N. Y.
See Composite Catalog Page 2426

for the past week was the Kern River field with seven new locations. The Wilmington field received five of the prospective new ventures, and the Cymric field received four.

CALIFORNIA SUCCESSFUL WILDCAT

Los Angeles County, Athens area: Shell Oil Co., Inc. 1 Union-Poindexter, 12-3s-14w, pumped 118 bbl. in 15 hours, gravity 30.7°, 6 per cent cut, elev. 194 ft., TD 9,272 ft.

CALIFORNIA WILDCAT FAILURES

Butte County, Willows area: General Petroleum Corp. 1 Llano Seco, 33-20n-1w, dry, elev. 105 ft., TD 8,306 ft.

Fresno County, West Coalinga area: Porter Sesnon et al 1 Chevalier, 12-21s-14e, dry in gray sand, elev. 936 ft., TD 1,447 ft.

Kings County, McClure Valley area: C. C. M. O. Co. 1 Orchard, 25-24s-17e, dry, elev. 691 ft., TD 2,503 ft.

Los Angeles County, Simi area: Union Oil Co. 9 Simi, 18-3n-17w, dry, no showings, TD 3,936 ft.

Yolo County, Meridian area: Shell Oil Co., Inc. 1-1 Meridian Unit, 5-9n-1e, dry, elev. 116 ft., TD 5,200 ft.

N. CENTRAL TEXAS

Second Caddo Pay Zone in Throckmorton Discovery

WICHITA FALLS.—J. H. Snowden et al 1 Howsley, Caddo discovery 4½ miles southeast of Throckmorton, southern Throckmorton County, was said to have a second pay zone in a lower Caddo section. A drill-stem test at 4,208-26 ft., open 1 hour, showed gas to the surface in 3 minutes, oil in 30 minutes, which flowed at the rate of 50 bbl. an hour. Flowing pressure was 800 psi., with bottom-hole pressure of 1,975 psi. in 15 minutes. Oil is 42° gravity. Operators planned to drill deeper to determine the entire pay section.

The original discovery drill-stem test was in the Caddo at 4,140-48 ft. Open 45 minutes, at that interval, gas came to the surface in 2 minutes, oil in 12 minutes, at the rate of 70 bbl. an hour. Surface flowing pressure was 600 psi., and bottom-hole pressure was 1,700 psi. Location of the 1 Howsley, in Block 300, BBB&C Survey, is approximately 2 miles northeast of the same operator's first discovery, earlier this year.

In southwest Throckmorton County, Ashland Oil Refining Co. 1-A Mathews, Block 67, Comanche Indian Reservation Survey, reported top of the Caddo at 4,567 ft., and drilled out to 4,572 ft. preparatory to running a drill-stem test. This well was said to be checking low on the Caddo, to Tom F. Hunter 1 Mathews, ½ mile to the south, which originally made a small well in the Caddo but at the present time is being deepened to the Mississippian.

In northwestern Archer County, miles south of Mankins, E. B. Clark 2 Lyles, Block 7, Hooper & Wade Survey, was a prospective Mississippi limestone discovery. Top on the limestone was 5,065 ft., and a 1-hour drill-stem test at 5,070-5,101 ft. recovered 2,900 ft. of oil. Previous perforations at 5,065-70 ft. were squeezed, and operators were to run tests on new holes at 5,100-20 ft. Total depth is 5,265 ft., about 59 ft. in the Ellenburger.

Location for a 6,000 ft. rotary wildcat was announced by W. H. Hammon and Warren Oil Corp., on the southeast edge of Wichita Falls. It is the 1 W. R. Robertson, in Section 15, Cherokee County School Land, and located 1 mile southwest of a dry hole in the Ellenburger at 6,195 ft.

NORTH TEXAS WILDCAT FAILURES

Archer County: Henry Grace Production Co. 1 L. F. Wilson, Blk. 85, ATNCL Sur., 8 mi. N Archer City, dry, TD 1,553 ft. in sand.

S. D. Johnson et al 1 J. Zotz, Lot 55, Blk. 3, Clark & Plumb Subd., 3 mi. SE

1600 Acres in Wyoming

Here is an unusual opportunity—one of Wyoming's finest pure-bred stock ranches. Beautiful mountain country and wonderful climate make it the perfect summer home or guest ranch as well.

Located in North Platte River Valley, protected by mountains on three sides. Main house and 3 guest houses, all modern, R.E.A. buried butane for cooking, Servel refrigeration. Two large barns, numerous sheds and corrals. Railroad spur and loading docks on property. Hard-surface highway to main gate. Three miles unsurpassed trout stream. Deer and antelope.

500 acres in alfalfa and hay, 100 in small grains, excellent soil. Prior water rights, no assessments. Well fenced and cross-fenced. Will support 350 head of pure-bred cattle and offspring and leave cash crop over.

For further information write, wire or phone owner:

M. D. Saylor, 1543 Pearl St., Denver, Colorado. MAin 3647.

This must be a cash sale to terminate co-ownership.

Price $95,000

FACTORY FACILITIES for production line method of **PICKLING,** and the application of **AMERCOAT** Vinyl Baked Phenolic linings in **DRILL PIPE, SALT WATER** and **CONDENSATE PIPE.**

Consult us for rates applicable to all producing areas. Lowered in-transit service rates. Also field service for coating and lining tanks and pipe.

NOWERY J. SMITH CO.
Galvanizing — Amercoat Plastic Coatings — Plating — Steel Whse. Stocks
Taylor-6111 P. O. Box 7398
HOUSTON, 8, TEXAS

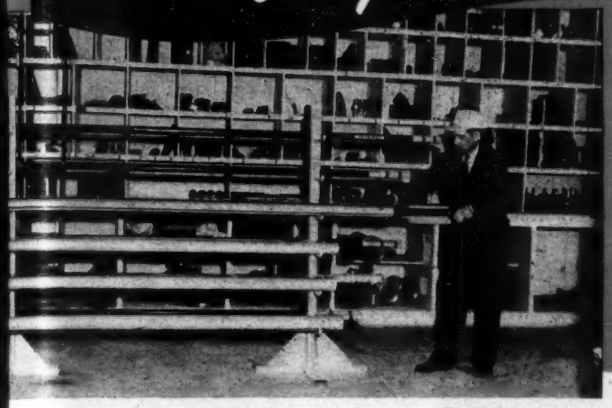
PORTABLE FIELD TELEPHONE

Local and common battery telephone with handset, generator, ringer, etc., in leather or heavy web case (do not specify). Designed for general field use—applicable for pipe lines, drilling operations, field parties.

New $15.95
Good Used $11.95

ELECTRONIC SUPPLIES
317 East 2nd St. (Dept. O), Tulsa 3, Okla.

How to get MAXIMUM SERVICE from your Subsurface Pumps

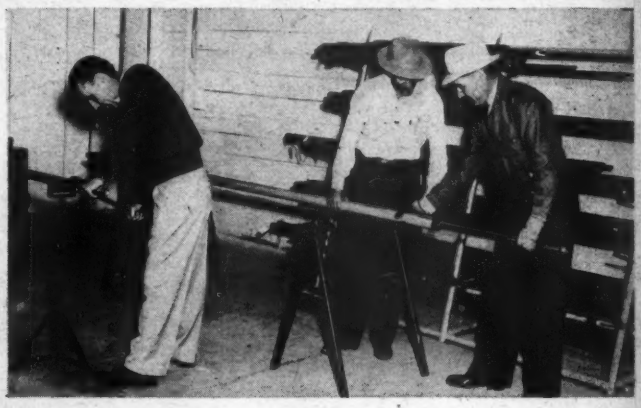


— and SAVE yourself MONEY!

STANDARDIZE on "Oilwell" A.P.I. pumps and parts and benefit from:

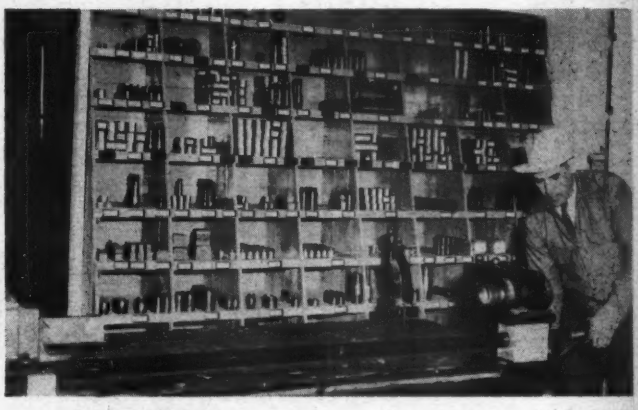
"Oilwell's" cumulative engineering experience, which has contributed many of the improvements found in today's production equipment—plus . . .
"Oilwell's" precision-manufacturing methods, as utilized in two of the industry's most modern plants—plus . . .
"Oilwell's" continuous field assistance, which helps you keep equipment producing on an economical performance basis.

1 **SELECT** the "Oilwell" Pump of correct size and design for the job—made from materials having the necessary metallurgical properties to withstand well conditions.



2 **EQUIP** each pump with assemblies and accessories that have been engineered to overcome the specific pumping problems encountered in your particular well.

3 **PROFIT** by "Oilwell's" prompt, experienced field service which not only supervises installations, but provides scientific maintenance facilities.



4 **RECONDITION** your pumps when necessary in well-equipped "Oilwell" shops, where skilled repairmen, proper tools and complete stocks of correct replacement parts are available to keep them in service as long as possible.

OIL WELL SUPPLY COMPANY

Branches Serving All Oil Fields

Executive Office—Dallas, Texas
Export Division Office—
30 Rockefeller Plaza
New York 20, N. Y.

Division Offices—Casper, Wyoming
Columbus, Ohio . . . Dallas, Texas
Houston, Texas . . . Tulsa, Oklahoma
Los Angeles, California

UNITED STATES STEEL

OIL WELL SUPPLY COMPANY · USS · OILWELL · UNITED STATES STEEL

"OILWELL"

Scotland, dry, TD 4,102 ft., no shows reported.

Baylor County: P. P. Langford, Jr. 1 Cowan, Sec. 91; T&NO Sur., 7 mi. SW Dundee, dry, TD 2,836 ft., DST 2,820-36 ft., recovered small amount of free oil, acidized and recovered salt water.

R-G Drilling Co. 1 J. V. Kisinger, W. Baker Sur., Block A, 22, 8 mi. SE Seymour, dry, TD 5,714 ft., Caddo 5,199 ft., Mississippi 5,561 ft., Ellenburger 5,611 ft.

Clay County: Frank Wood 1 P. Bilbrey "D," Blk. 27, Pratt Subd., 4 mi. SW Thornberry, dry, TD 1,500 ft. in shale.

Cooke County: W. Fitzhugh Catlett 1 H. M. Berry, Sec. 13, SPRR Sur., 4 mi. W Hood, dry, TD 3,060 ft.

A. R. Dillard 1 F. R. English, J. M. Culp Sur., A-1,538, 4 mi. SW Hood, dry, TD 2,935 ft.

Jack County: Charlie Grace Drilling Co. 1 C. Koeninger, Blk. 13, J. J. Gholson Sur., 16 mi. SE Jacksboro, dry, TD 5,154 ft., Caddo 4,219 ft.

Young County: Grace & Grace 1 N. R. Martin, G. W. Cottle Sur., 4 mi. N Eliasville, dry, TD 4,213 ft., Caddo 3,454 ft.

WEST CENTRAL TEXAS WILDCAT FAILURES

Coleman County: C. J. Johnson 1 T. Griffis, W. Woolsey Sur. 294, 5 mi. SW Coleman, dry, TD 2,894 ft., Gardner sand 2,400 ft., Caddo 2,550 ft.

Taylor County: Woodley Petroleum Co. 1 M. G. Reed, M. P. King Sur. 434, 3 mi. SW Lawn, dry, TD 4,409 ft., Gardner 4,078 ft., Caddo 4,322 ft., PB 4,095 ft., acidized and swabbed 10 bbl. oil and 25 bbl. water.

Throckmorton County: Oil Well Drilling Co. 1 G. M. Dannenhold, Sec. 3,023, TE&L Sur., 6 mi. NE Throckmorton, dry, TD 4,848 ft., Strawn 3,460 ft., Caddo 4,340 ft., show of oil 4,340-50 ft., DST recovered mud, Barnett 4,812 ft., Mississippi 4,827 ft., elev. 1,278 ft.

Structural Painters for Southern Industry

R. A. STOKES, INC.

635 WILSON BLDG. CORPUS CHRISTI, TEXAS

KANSAS

Western Kansas Exploratory Tests Show Gas

STANOLIND OIL & GAS CO. 1 Repp, NE NE NW 29-28s-17w, Kiowa County, a rank wildcat, had a big gas show in top of Mississippi lime, topped at 4,851 ft. Drill-stem test at 4,851-61 ft. showed gas at surface in 5 minutes and in 8 minutes developed big gas flow which blew all loose objects from derrick floor. Bottom-hole pressure was 1,900 psi.

Stanolind Oil & Gas Co. 1 Wheatley, NE NE SW 23-33s-31w, Seward County, another rank wildcat in western Kansas, recovered 60 ft. oil and gas-cut mud on drill-stem test at 4,435-55 ft., in Lansing, which was topped at 4,314 ft. A second test at 4,681-4,729 ft. recovered 30 ft. mud and 60 ft. gas-cut mud with trace of oil. After core from 4,898-4,913 ft. showed oil, a drill-stem test was made at 4,847-4,913 ft. which recovered 240 ft. of oil and gas-cut mud. Drilling has been continued and tools are below 5,020 ft.

Stanolind Oil & Gas 1 Matkin, SW NE NE 14-35s-33w, Seward County, is a 9,000,000 cu. ft. gas well in Morrow sand topped at 6,103 ft. Total depth is 6,238 ft. Lansing was topped at 4,370 ft. and Mississippi at 6,143 ft.

Darby & Bothwell 1 Weitzel, SW SW NW 1-16s-20w, Rush County, originally completed in conglomerate and designated the Weitzel pool, has been completed in Lansing with 672 bbl. pump potential. Hole was drilled to total depth of 3,695 ft. into quartzite. Plug was set at 3,463 ft. and pipe was perforated from 3,444-56 ft. and from 3,406-14 ft.

Cities Service Oil Co. 1-E Hanson, SW NE 28-8s-26w, Sheridan County, recovered 115 ft. of oil-cut mud on drill-stem test at 3,787-97 ft., in Lansing, which was topped at 3,698 ft. Total depth is 3,950 ft. Pipe is set to test. The well is located between the Studley and Southwest Studley pools.

Anderson-Prichard Corp. et al 1 Lloyd, NW NW SW 33-9s-22w, has pipe set at 3,899 ft. to test Lansing, which was topped at 3,805 ft. Conglomerate was logged at 4,006 ft. and Arbuckle at 4,020 ft. Total depth is 4,117 ft. The test is located 9 miles southwest of Morel pool.

Dozier & Lowell 1 Hays, NE NE SE 28-9s-18w, Rooks County, pumped 350 bbl. 31°-gravity oil and no water on potential test. Production is from Lansing pay at 3,405-13 ft. Lansing was topped at 3,325 ft. and Arbuckle at 3,586 ft.

Cities Service Oil Co. 1 Suiter, SW SW 9-24s-15w, Stafford County, is a 26,000,000 cu. ft. gas well and is the second completion in the O'Connor Arbuckle gas pool. The Suiter well is a north offset on 40-acre spacing to the discovery well and is 9 ft. higher on top of the Arbuckle.

KANSAS SUCCESSFUL WILDCATS

Rush County: Great Lakes Carbon et al 1 W. H. Dirks, SW SW SE 16-18s-18w, pumped 122 bbl. of 42.4°-gravity oil per day from Arbuckle at 3,838-51 ft.; anhydrite 1,226 ft., Topeka 3,145 ft., Heebner 3,412 ft., Lansing 3,445 ft., TD 3,865 ft.

Stafford County: Sohio 1 Schrepel, SE SE SE 12-21s-12w, pumped 363 bbl. of 32.4°-gravity oil per day from Arbuckle at 3,482-3,515 ft.; anhydrite 595 ft., Lansing 3,185 ft., Heebner 3,044 ft., brown lime 3,168 ft., conglomerate 3,426 ft., Simpson 3,480 ft., TD 3,515 ft.

KANSAS WILDCAT FAILURES

Barber County: Champlin 1 Storm, NE SE NE 12-33s-14w, dry, TD 5,332 ft., Lansing 4,214 ft., Mississippian 4,716 ft. with a slight show of oil, Maquoketa 5,036 ft., Simpson 5,175 ft., Arbuckle 5,288 ft.

Barton County: Stanolind 1 Cora Baker "B," NW SE NE 19-20s-14w, dry, TD 3,735 ft.; anhydrite 860 ft., Lansing 3,330

ft., conglomerate 3,580 ft., Simpson 3,630 ft., Arbuckle 3,635 ft.

Rice County: Three-Way Drilling 1 Heckel, SW SW SW 23-21s-10w, anhydrite 800 ft., Lansing 3,063 ft., conglomerate 3,372 ft., Simpson 3,400 ft., Simpson sand 3,412 ft., Arbuckle 3,456 ft.

Rooks County: Nate Appelman 1 Scharndt, SW SW SE 25-9s-18w, dry, TD 3,678 ft., anhydrite 1,470 ft., Lansing 3,328 ft., conglomerate 3,565 ft., Arbuckle 3,640 ft., no shows.

Stanolind Oil & Gas 1 Forest Stamper, SE SE NE 6-8s-17w, dry, TD 3,385 ft., anhydrite 1,260 ft., Topeka 2,760 ft. with a slight show of oil, Lansing 3,005 ft., Arbuckle 3,309 ft.

NEBRASKA WILDCAT FAILURE

Banner County: Banner Oil Co. 1 Lovercheck, C SE SE 27-19n-57w, dry, TD 6,788 ft., Greenhorn 5,400 ft., muddy sand 6,288 ft., Dakota 6,425 ft., show of gas at 5,500-50 ft., drill-stem test at 6,426-56 ft. recovered 500 ft. of fresh muddy water.

LA.-ARK.

Ninth Oil Producer Extends Ora Field

SHREVEPORT.—Sellars-Wilson-Ewing Co. 1 Perry J. Tucker, 3-21n-1w, became the ninth producer in Ora field of Union Parish, and extended production approximately 2 miles to the southwest. Well has flowed an unestimated amount into pits to clean itself, and operators are confident it will be good for 250 bbl. of oil a day. Production is from the Nacatoch sand through perforations at 2,140-50 ft. It was said to have a 35-ft. sand section. Total depth is 2,565 ft.

Active development at Ora began about 2 months ago, with nine producers and four dry holes in the immediate area of the discovery, and eight dry holes within a radius of 4 miles. Location of the field is 7 miles northwest of Farmerville.

In Red River Parish, Union Producing Co. 1 Anna Campbell, 20-12n-10w, was drilling below 6,347 ft. in the lower Glen Rose section. Cores at 6,327-47 ft. recovered hard, dense, gray shaly limestone with no shows. A drill-stem test at 6,336-47 ft., open 20 minutes, found no shows of oil but recovered 20 ft. of gas-cut mud. Operators' log placed the Massive anhydrite at 4,632-4,853 ft., and the Pettit at 5,910 ft.

Other wildcat reports included: Union and Pure Oil Co. 1 L. P. Frazier, 14-14n-6w, Bienville Parish, reaming down at 6,363 ft. A drill-stem test at 6,314-30 ft., open 30 minutes, produced a very slight blow and recovered 15 ft. of mud, with no shows. In Bossier Parish, M. A. Halsey 1-B Skidmore, 1-16n-11w, was swabbing salt water with a slight show of oil. Hassie Hunt 1 G. W. James, 10-22n-4w, Claiborne Parish, had total depth at 7,323 ft. in the Travis Peak, and was shut down for rig repairs. Skelly Oil Co. 1 Nash, 20-12n-16w, DeSoto Parish, was drilling below 9,072 ft. in Travis Peak. Operators ran electric log to 8,850 ft., then cut four side-wall cores and recovered white sand with no shows. In Sabine Parish, 6 miles west of Zwolle, H. H. Duck 1 Peavy-Wilson was drilling below 5,676 ft. in Glen Rose, and headed for the Travis Peak. In Webster Parish, Hunt Oil Co. 1 Haynesville Mercantile Co., 9-23n-9w, was drilling below 8,370 ft. in the Bodcaw. In Winn Parish, Stanolind Oil & Gas 1 Tremont Lumber Co., 30-12n-1w, was drilling below 11,797 ft.; it logged base of the lower anhydrite stringer at 8,783 ft., Pettit at 9,848 ft., and the Travis Peak at 10,326 ft.

In Lafayette County, Arkansas, McAlester Fuel Co. 1-A J. W. McDonald, 23-17s-24w, was last reported drilling ahead below 8,961 ft. in the Cotton Valley. Frank Frankel 1 Locke, 19-13s-30w, Little River County, was drilling below 4,545 ft. Sample tops released were: Massive anhydrite 2,620 ft., Travis Peak 3,180 ft., and tentative top on the Buckner at 4,400 ft. In Miller County, Big Chief Drilling Co. 1 Froid, 29-17s-27w, was drilling below 3,969 ft. in shale. Sample tops reported were: Arkadelphia 1,820 ft., Saratoga 2,345 ft., and base of the Annona 2,765 ft.

NORTH LOUISIANA SUCCESSFUL WILDCAT

Catahoula Parish: Discovery of Jonesville field—Penrod Drilling Co. 1 J. P. Mitchell, NW NW 36-8n-7e, pumped 7 bbl. oil and 17 bbl. sediment and water, stringer sand in Tuscaloosa 9,320-34 ft., TD 9,471 ft.

NORTH LOUISIANA WILDCAT FAILURES

East Carroll Parish: Union Producing Co. 1-A J. A. O'Brien, 5-19n-11e, dry, TD 2,734 ft., Wilcox 1,527 ft., Midway 2,240 ft.

Morehouse Parish: Angle & Crain 1 E. M. Clark, SW SW 2-20n-7e, dry, TD 4,036 ft., Wilcox 1,462 ft., Midway 2,082 ft., Gas Rock 2,542 ft., Travis Peak 2,597 ft., Cotton Valley 2,833 ft., elev. 104 ft.

Red River Parish: British-American 2 T. Wimberly, SW NW 2-13n-10w, dry, TD 2,711 ft., annona 1,460-1,573 ft., Austin 2,486 ft., Tuscaloosa 2,696 ft., elev. 185 ft.

Richland Parish: Fred Kalit et al 1 E. Greer, SW NW 25-17n-7e, dry, TD 3,520 ft., chalk 2,682 ft., Gas Rock 2,694 ft., James limestone 3,398-3,442 ft., Pine Island shale 3,442-3,519 ft., elev. 88 ft.

Union Parish: Fletcher & Sneed 1 R. F. Ward, SE NW 30-22n-1w, dry, TD 2,537 ft., Wilcox 1,021 ft., Midway 1,432 ft., annona 2,404 ft., Tokio 2,453 ft., Tokio sand 2,512 ft., elev. 159 ft.

ARKANSAS WILDCAT FAILURE

Union County: J. G. Sutton 1 C. C. Rushing, SW SW NW 20-17s-13w, dry, TD 3,552 ft., Annona 2,598 ft., Red Beds 2,934 ft., Meakin 2,601 ft.

MICHIGAN

Kimball Lake Field Wells Prorated to 75 Bbl. Per Day

SAGINAW.—Michigan's new, prolific source of crude oil—the Kimball Lake field in Garfield Township, Newaygo County—Monday went under stricter proration and seven more wells were completed for combined initial potential of 6,000 bbl. a day. At the request of most of the landowners and operators in the field, the State Conservation Department issued an emergency order cutting production per well 25 per cent to 75 bbl., is effective as of August 4 for 21 days.

The state commission will be called into session to consider continuing the reduced take from the Kimball Lake wells.

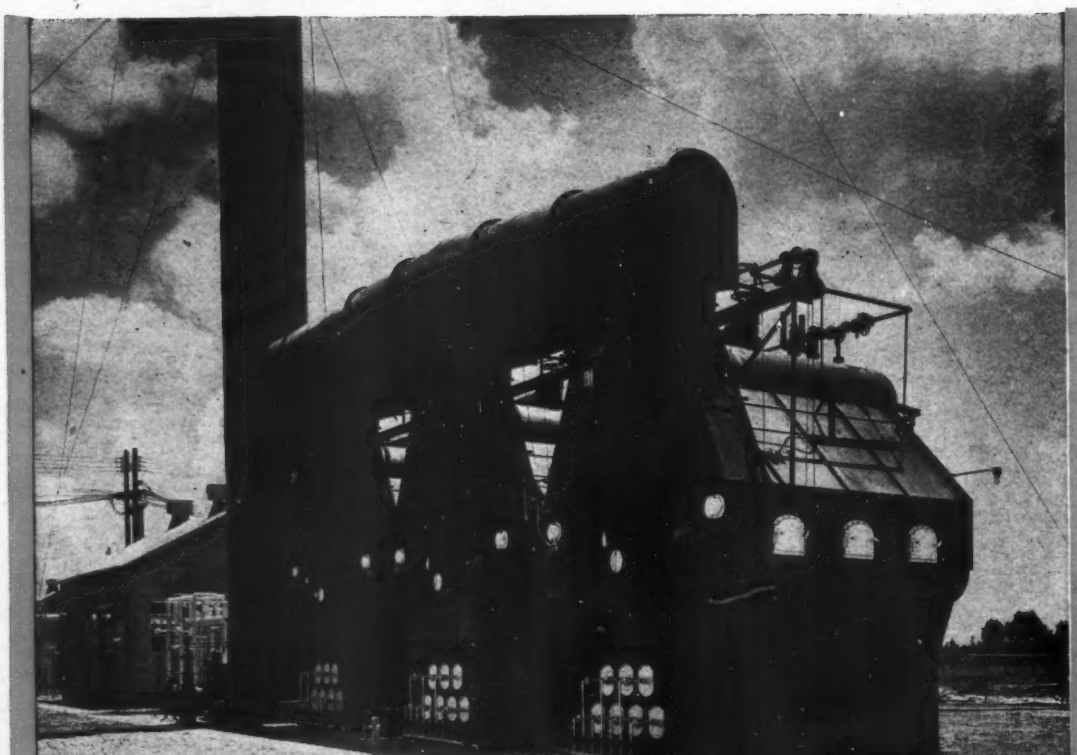
Field operations for the past week resulted in 22 completions for 11 oil wells, 8 gas wells and 3 dry holes. Two of the failures were wildcats.

The seven new Newaygo wells, rated initially at from 100 bbl. a day pinched to an estimated potential of 2,000 bbl. a day are in Sections 12, 13, and 14. One of the wildcat failures was in Grant Township, adjacent to Garfield.

A 300-bbl. Claybanks-Oceana completion was the best of the four other producers; one for 70 bbl. in Kent County, and two smaller wells in Montclam County were the others. The new gas wells had combined potential of 57 million cubic feet, included four in Mecosta County, three in Clare, one in Isabella.

Total Michigan production has increased with Newaygo developments, after dropping in June to a daily average of 42,296 bbl., according to the Michigan Oil & Gas

IN DESIGNING
YOUR PUMPS you will need many bolts and studs involving special material, heat treatment, and threaded to close tolerances You will be writing the specifications for the type of bolting that has made ERIE known from Coast to Coast We have supplied the heavy industries with their specials for many years.
SEND YOUR BOLTING SPECIFICATIONS TO A SPECIALIST
ERIE BOLT & NUT CO.
SUBSIDIARY OF BARIUM STEEL CORPORATION
ERIE, PA.
STUDS • BOLTS • NUTS
ALLOYS • STAINLESS • CARBON • BRONZE



Wickes

A-TYPE water tube boilers

Three outstanding design and construction advantages combine to make the Wickes A-Type Water Tube Boiler the most efficient boiler of its type. • 1) It is engineered with approximately twice the amount of black surface as found in the average boiler. This surface, by effective radiant heat absorption, cools the furnace and permits carrying a high CO_2, thus substantially increasing efficiency. • 2) Gases of combustion travel in well-insulated, confined passages across the rows of tubes which are staggered in the Wickes A-Type Boiler. This assures optimum convection heat pick-up, and assists in maintaining a high operating efficiency under varying furnace and load conditions. • 3) Two simple U-tubes compose the Wickes A-Type Boiler insuring fast, positive water circulation necessary to high heat absorption. No tortuous paths, no excess resistances to obstruct flow. • Wickes A-Type Water Tube Boilers are made in capacities from 15 H.P. to 200,000 lbs. steam per hour, with pressures up to 850 lbs. per sq. in. Drums welded to A.S.M.E. standards. Write for descriptive catalog.

Wickes

THE WICKES BOILER COMPANY

SAGINAW, MICHIGAN • ESTABLISHED 1854

SALES OFFICES: Atlanta • Boston • Charlotte, N. C. • Chicago • Denver • Detroit • Fort Worth, Texas • Indianapolis • Jacksonville • Los Angeles • Milwaukee • New York City • Peoria, Ill. • Pittsburgh • Saginaw • San Francisco • San Jose, California • Seattle • St. Louis • Tulsa, Oklahoma • Mexico City.

Association, which listed 3,521 producing wells.

MICHIGAN WILDCAT FAILURES

Allegan County, Heath Township: Ford Oil Co. 1 Thomas and J. Cave, NW SE SE 21-3n-14w, dry in Traverse limestone, TD 1,450 ft.

Newaygo County, Grant Township: Merrill Drilling Co. 1 R. M. and J. A. Longcore, SE SE SW 25-11n-12w, dry in Dundee, TD 2,957 ft.

EASTERN TEXAS

Humble Running Pipe to Test Shelby County Test

DALLAS.—In the Huxley area of Shelby County, Humble Oil & Refining Co. 1 Elizie Fleming, John Hailey Survey, was running casing for completion tests. This prospective discovery, first for the area, was said to have two possible pay sections. The Pettit was topped at 6,325 ft., with porosity at 6.594-6,608 ft., and side-wall cores from the Rodessa zone at 5,542-77 ft. indicated possible production. Total depth is 7,450 ft., in the Travis Peak topped at 7,250 ft. Humble was preparing to move in a rig for another test, on the J. S. Bailey tract, about 1 mile to the north.

Finding of crude oil in the second and third well on the northwest flank of the Grapeland gas-distillate field in Houston County was reported. Geier & Jackson 1 C. C. Brown, in the F. H. Parker Survey, was completed for a daily potential of 264 bbl. daily, from pay at around 5,900 ft., flowing through 3/16-in. choke, on a tubing pressure of 960 psi., and 1,070 psi. casing pressure. The oil tested 48° gravity.

The third well is Geier & Jackson 1 Adams, in the L. Purdy Survey, northeast of the 1 C. C. Brown. While completion tests have not been run, operators said the Adams would equal the Brown test. Both wells have exceeded the discovery oil well, Lone Star Producing Co. 1 Ritchey, located 1,500 ft. to the southeast of the 1 C. C. Brown, and which gaged 120 bbl. of oil a day through ¼-in. choke from 10 ft. of pay topped at 5,885 ft. Pay section in this well was called the sub-Clarksville sand.

Geier & Jackson have staked locations for two additional tests. One will be the 1 P. Herod, in the J. D. Jeffrey Survey, and the other will be the 1 W. T. Pridgeon, in the Scheptrine Survey. Both tests will explore all zones to the Woodbine, regular pay zone for Grapeland. Lone Star was also said to be planning additional tests when materials are available.

In Anderson County, 2¼ miles northwest of Slocum, Continental Oil Co. 1 F. M. Royall had total depth at 8,986 ft., and was conditioning hole to core. Operators reported a gas show at 8,980-82 ft., cutting at 13 minutes per foot, and at 8,982-86 ft., cutting at 5 minutes per foot, returning mud samples bady cut with gas. Sample top on the Travis Peak was 8,800-10 ft.

Eight miles northeast of Marshall, in Harrison County, Stanolind Oil & Gas Co. 1 Slaughter was drilling below 8,673 ft. in sand and shale. Cotton Valley was topped at 8,185 ft. In Hopkins County, 5 miles south of Cumby, T. G. Shaw Trustee 1 Hattie Lee and W. B. Thomas, was drilling below 5,189 ft. It is a Paluxy test. Base of the Austin was placed at 3,330-50 ft., and top of the Georgetown at 4,740-50 ft. In Robertson County, miles north of Calvert, J. E. Devant and M. Graham 1 Fagan was drilling ahead below 4,230 ft. in shale.

EAST TEXAS WILDCAT FAILURES

Gregg County: B. F. Phillips 1 Leo. Bradshaw, Stephen Winship Sur., 5 mi. SW Gladewater, dry, TD 3,750 ft., no tops available.

Van Zandt County: T. Armstrong 1 W. T. Hall, J. Wortham Sur., 9 mi. NE Van, dry, TD 1,900 ft., sand with show of oil 1,368-70 ft.

APPALACHIAN FIELD

Cambria County Wildcat Tops Injun Sand at 978 Ft.

PITTSBURGH.—In Cambria Township, Cambria County, southwest Pennsylvania, Peoples Natural Gas Co. topped the Injun sand at 978 ft. in the test on Krempasky farm and is drilling at 1,638 ft. This is the first reported marker from one of the several eastern wildcats being drilled by this company.

In Richmond Township, Crawford County, northwest Pennsylvania, Bean & White logged the Tully lime at 2,814-98 ft. and topped the Onondaga lime at 3,176 ft. in an unreported wildcat drilling on the Harry F. White farm. It is located 1,900 ft. from the north line and 9,300 ft. from the east line of Townville Quad, Section A.

In Summit Township, Erie County, Appalachian Development Corp. topped the Onondaga lime at 2,089 ft. in the test on Chester F. Fuhrman farm. In Wayne Township, Pennsylvania Gas Co. topped the Onondaga at 3,199 ft. in the test on John Kalika tract.

New locations, in southwest Pennsylvania, totaled 12, one in Cowanshannock, Kittanning and Valley townships, Armstrong County; one in Clarion, Monroe and Porter townships, Clarion County; one in Wayne Township, Greene County; one in Washington Township, Indiana County; one in East Finley, Fallowfield, West Pike Run townships, and Twilight Boro, Washington County.

In Ripley district, Jackson County, West Virginia, Godfrey L. Cabot, Inc., topped the Oriskany sand at 4,921 ft. in the wildcat Lucy Boswell with about 211,000 cu. ft.

Simple arithmetic applies to rods and liners too. Excellent materials plus excellent workmanship, testing and hardening methods pay off with excellent results!

MACHINING + HARDNESS

More Operators are Discovering the Efficiency of JP RODS and LINERS

Add up the qualifications of JP Rods and Liners. You'll find—JP uses top-quality mateiral . . . JP's expert oil country machinists know how to tool this equipment to exacting standards . . . JP "hardens" each and every JP Rod and Liner by a patented process and then subjects them to approximately 600 (or better) Brinell test.

For these reasons, operators all over the world are getting far better than desired results from JP Rods and Liners.

CALL — WRITE — WIRE — CABLE

Made to A.P.I. Standards, JP Rods and Liners are available in all stock sizes (and special sizes) to fit any slush pump. For information on sizes and prices—ask for our New Catalog or give us your specifications.

JP

J P Machine & Tool Company

1534 S. E. 29th P. O. BOX 4968 TEL. 6-8700 OKLAHOMA CITY

gas, high gage, to present depth of 4,936 ft. The Corniferous lime was topped at 4,820 ft. The same operator topped the Corniferous lime at 5,169 ft. in the test 1,228 J. L. McLean with casing run to 5,174 ft.

In Cabin Creek district, Kanawha County, West Virginia Gas Corp. is drilling a deep test on Eastern Gas & Fuel Associates tract which has reached 4,800 ft. In Elk district, several tests are drilling through the Corniferous lime.

New locations in West Virginia totalled 15 and in Crook district, Boone County; Henry district, Clay County; Center, DeKalb and Glenville districts, Gilmer County; Ripley district, Jackson County; McKim district, Pleasants County; Grant district, Wayne County; Spring Creek district, Wirt County; Union district, Wood County; Center and Oceana districts, Wyoming County.

The Texas Co. rotary wildcat on the Deah tract in Greenbrier County, West Virginia, was erroneously credited with testing 103 million cubic feet. of gas in 1 hour in last week's issue. This should have been 103 thousand cubic feet.

WEST VIRGINIA SUCCESSFUL WILDCATS

Braxton County, Otter district: C. E. Engle et al 1 Herbert Moore, 300,000 cu. ft. gas, Salt sand, total depth 1,545 ft.

Wirt County, Union district: Glen W. Roberts 1 E. C. Mills, 1 bbl., Maxton sand; 984,000 cu. ft. gas, Injun sand; total depth 1,789 ft.

WEST VIRGINIA UNSUCCESSFUL WILDCATS

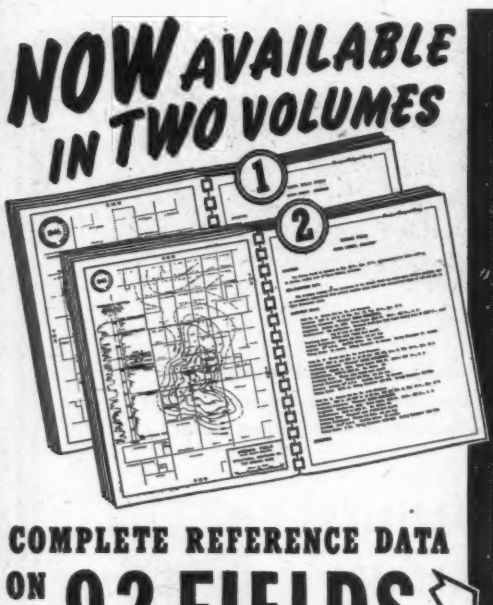
Hancock County, Clay district: George W. Dawson 1 Wayne Dornan, dry, total depth through Oriskany sand 4,722 ft. Onondaga lime topped at 4,530 ft.

Roane County, Smithfield district: K. M. Hunt 1 Noble Moore, dry, Injun sand, total depth 1,850 ft.

SOUTHWEST PENNSYLVANIA SUCCESSFUL WILDCAT

Westmoreland County, Bell Township: Bryan Bowman et al 1 J. A. McQuaide, 1,300,000 cu. ft. gas, total depth 1,653 ft. Murrayville sand gas 1,590 ft.; Hundred Foot sand gas 1,651 ft.

NOW AVAILABLE IN TWO VOLUMES



COMPLETE REFERENCE DATA ON 92 FIELDS

In LA., ARK., MISS., ALA.

Here is the most complete set of reference books of its kind ever printed. Petroleum Engineers, Geologists, Geophysicists and Executives will find them invaluable. In a nut-shell here is what you can expect to find: MAPS . . . include a structural contour and ownership map of almost every field.

SECTIONS . . . Authentic Structural or Columnar Section is shown of each area.

DATA . . . for each field includes History; Development; Producing Zones; Discovery Well Data; Production Data; Pipe Line Connections.

Volume I, 316 Pages $12.50
Volume II, 224 Pages $10.00

BOTH Volumes ONLY ... $22.50
(All Prices Prepaid)

Order Your Set — TODAY!

Make Check or Money Order Payable to

SHREVEPORT GEOLOGICAL SOCIETY
Box 750 Shreveport, Louisiana

OIL AND GAS FIELDS COVERED

VOLUME I

ALABAMA
Gilbertown

ARKANSAS
Atlanta
Big Creek
Buckner
Calhoun
Columbia
East Schuler
Fouke
Hillsboro
Lewisville
Magnolia
McKamie
Mt. Holly
Nick Springs
Salem Church
Schuler
Stamps
Texarkana
Troy
West Atlanta

LOUISIANA
Ada
Bear Creek
Lake Bistineau
Calvin
Catahoula Lake
Chatham
Cypress Bayou
Haynesville
Hico
Holly
Holly Ridge
Indian Bayou
Lisbon
LA. (Cont'd)
Little Creek
Logansport
Lucky
Nebo
North Lisbon
North Nebo
Olla
Ruston
Sibley
Sligo
Simmsboro
South Olla
Spider
Sugar Creek
Tremont
Trout Creek
Vixen
Willow Lake

MISSISSIPPI
Baxterville
Brookhaven
Carthage Point
Cary
Cranfield
Eucutta
Fayette
Flora
Gwinville
Heidelberg
Hub
Langsdale
Mallalieu
Pickens
Tinsley
Soso

Four triple size Stratigraphic Sections

VOLUME II

ARKANSAS
Dorcheat
Gum Creek
Macedonia
Midway
New London
Stephens-Smart
Urbana
Village
Wesson

LOUISIANA
Ashland
Athens
Beekman
Benton
LA. (Cont'd)
Big Creek
Big Island
Choudrant
Cotton Valley
Delhi
Driscoll
E. Haynesville
Elm Ridge
Lake Larto
Lake St. John
Manifest
Sailes
Standard
W. Delhi

Fourteen triple size Stratigraphic Sections

TEXAS GULF COAST

Three New Pools and 3 New Pays in Week's Completions

HOUSTON—A new gas-condensate pool has been opened in Wharton County by Ralph H. Grant and J. P. Petkas 1 M. F. Rooker. Located approximately 4 miles northeast of Gobbler Creek production in the B. B. Pearce Survey. Total depth is 5,812 ft. in the Vicksburg, and production is through perforations at 4,049-55 ft. On potential test this well gaged 76,000,000 cu. ft. of gas per day on open flow, and 2,563,000 cu. ft. gas per day through ¼-in. choke, and 0.17 bbl. of 37°-gravity condensate for every million cu. ft. of gas. Tubing pressure was 1,660 psi., shut-in pressure 1,664 psi.

A new oil discovery in the South El Campo area of Wharton County is Floyd L. Karsten 1 Frank Beal, located in the ETRR Survey, Section 51, ¾ mile west northwest of the No. 1 Reitz discovery gasser. Total depth is 7,052 ft., with 5½-in. casing set to 6,618 ft. On initial gage the well flowed 60 bbl. of 32°-gravity oil through 8/64-in. choke, through perforations at 5,561-5,565 ft. Tubing pressure on flow was 950 psi. with 1,750 psi. on the casing.

Stanolind Oil & Gas Co. 37 B. D. Rooke, opened a new oil pay zone at La Rosa field in Refugio County. On potential gage flowed 187 bbl. of oil per day through ⅛-in. choke, with tubing pressure 1,290 psi., and gas-oil ratio 1,228. Production is through perforations at 6,850-ft. level. Total depth is 9,524 ft. This well is located in J. M. Aldrete Grant.

C. H. McSpadden 1 Mary R. Goggans, wildcat in Calhoun County, 7 miles southeast of Port Lavaca and 4½ miles northeast of old Coloma Creek field, is ready for production test after setting 5½-in. casing on bottom at 6,200 ft. level. The well logged a good showing of oil in the Discorbis zone below 6,510 ft., and also has showings in the Miocene. This discovery is located in the Benito Morales Survey.

Sunray Oil Corp. is drilling ahead below 8,123 ft., going to the 8,500-ft. contract depth in 1 George H. Brandt, potential new oil discovery well northwest of the Weser field, in north corner of Goliad County. This well topped the Slick sand at 7,707 ft., and drill-stem test at 7,709-15 ft., using ¼-in. choke, top and bottom, developed 130 psi. working pressure on 30-minute test, started flowing on ¾-in. top choke 4 minutes after being shut in, flowed water cushion and oil for 70 minutes, recovered 1,220 ft. of 31.5°-gravity pipe-line oil and trace of mud. On test at 7,715-25 ft., open 15 minutes, with 500-ft. water cushion, developed 62 psi. working pressure and recovered 4,135 ft. of 31.1°-gravity oil and 215 ft. salt water, and water cushion with bottom-hole pressure 3,525 psi., open and 3,525 psi. closed. A massive Wilcox sand was cored at 7,810-17 ft., with no shows, and electrical log was run to 8,011 ft. before drilling ahead.

G. E. Glasco 1 Lutcher & Moore, an old well worked over in the West Orange field of Orange County, has opened a new oil sand. Originally drilled to total depth of 6,975 ft., operator plugged back to a depth of 3,524 ft. and perforated from 3,475-3,485 ft. for the completion. On a 24-hour gage the well flowed at the rate of 246 bbl. of 24°-gravity oil through 3/16-in. choke with

150 psi. pressure on the tubing. This well is located in the William Dyson Survey.

There were 37 new locations reported, with 25 being wildcat starts, 2 each in Harris and Victoria, and 1 each in Bee, Brazoria, Calhoun, Chambers, Fort Bend, Galveston, Jackson, Live Oak, Polk, Refugio, Walker and Wharton counties. Six of the 12 exploratory tests completed were successful. Three new pools were opened, one gas in Jackson County, one gas-condensate in Lavaca and Wharton counties. A new condensate pay each for Yoakum pool in Lavaca County and Kittie West pool in Live Oak County. A new oil pay was opened in West Orange pool, Orange County. Six wildcats were dry, one each in Calhoun, Chambers, DeWitt, Fort Bend, Liberty, and Wharton counties.

TEXAS GULF COAST SUCCESSFUL WILDCATS

Jackson County: New gas pool—Texas Co. 1 S. G. Drushell et al, Salem field, in I&GN RR Sur., 6 mi. N of Inez, top pay 2,560 ft., TD 5,018 ft., PB 2,580 ft., perf. 2,560-65 ft., IP: 8,000,000 cu. ft. gas per day on open flow, dry gas, flow 1,612,000 cu. ft. gas per day through ¼-in. choke, 1,075 psi. working pressure, shut-in pressure 1,115 psi., no water.

Lavaca County: New gas-condensate pool Forest Oil Corp. 1 H. C. Obelgoner, in James Campbell Sur. 2, 2 mi. N of Hallettsville, top pay 7,510 ft., TD 9,001 ft., perf. 7,510-16 ft., IP: 40,000,000 cu. ft. gas per day on open flow, with condensate, shut-in pressure 2,765 psi., no water.

New condensate pay Yoakum pool—Pure Oil Co. 1 J. D. Turner Unit, in James May Sur., top Wilcox zone 6,115 ft., TD 8,701 ft., PB 8,683 ft., perf. 8,635-75 ft., IP: 25 bbl. condensate per day and 1,882,000 cu. ft. gas per day through 5/32-in. choke, 40,000,000 cu. ft. gas per day on open flow, gas-condensate ratio 30,000, tubing pressure 2,900 psi., gravity 53.1°, no water.

Live Oak County: New condensate pay, Kittie West Pool—Continental Oil Co. 1-A Kittie West Schreiner, in J. Poitevent Sur., top pay 6,878 ft. (Luling sand), TD 7,400 ft., perf. 6,875-85 ft., IP: 26 bbl. condensate per day and 1,646,000 cu. ft. gas per day through 5/32-in. choke, gas-oil ratio 62,800, TP 2,315 psi., SIP 2,515 psi., gravity 42.8° (green condensate), no water.

Orange County: New oil pay West Orange pool—G. E. Glasco 1 Lutcher & Moore, in Wm. Dyson Sur., old well worked over, originally completed in 1936 at OTD 6,975 ft., plugged back to 3,524 ft., top sand 3,475 ft., perf. 3,475-85 ft., IP: 246 bbl. oil per day through 3/16-in. choke, tubing pressure 150 psi., gravity 24°, 1.3 per cent water.

Wharton County: New gas-condensate pool —Ralph H. Grant and J. P. Petkas 1 M. F. Rooker, in B. B. Pearce Sur., 4 mi. NE of Gobbler Creek discovery, TD 5,812 ft., top sand 4,049 ft., perf. 4,049-55 ft., IP: 76,000,000 cu. ft. gas per day open flow, and 2,563,000 cu. ft. gas per day through ¼-in. choke, and 0.17 bbl. condensate per million cubic feet gas, TP 1,660 psi., SIP 1,664 psi., gravity 37.6°.

TEXAS GULF COAST WILDCAT FAILURES

Calhoun County: Texas Co. 1 State Tr. 131, in Matagorda Bay area, dry, TD 5,750 ft.

Chambers County: Warren Wright 1 Moss Est., R. E. Booth Sur., 3½ mi. W of production at Willow Slough field, dry, TD 9,205 ft.

DeWitt County: Pontiac Refg. Corp. and Atlatl Royalty Corp. 1 Harry Garrett, in Nicholas Peck Sur., in extreme east corner of county, 3 mi. NE of Fordtram, dry, TD 9,050 ft.

Fort Bend County: Humble 1-D Bankers Mortgage Co., SW flank of Sugarland Dome, in Wm. Little Sur., dry, TD 7,504 ft.

Liberty County: William Herbert Hunt Tr. Est. 1 B. H. Simmons et al, Dayton area, in H&TC Sur., Sec. 109, dry, TD 9,974 ft.

Wharton County: Johnston & Johnston 1 J. L. Myatt, in Jos. Hyland Sur., 1½ mi. S of extreme W side production at Withers, dry, TD 5,825 ft.

MISSISSIPPI

City Bank Test Swabs 40 Per Cent Oil

JACKSON.—Union Sulphur Co.'s 1 Earline Parker, near Sandersville in Jones County, continued testing the City Bank zone, with little results. Casing was perforated between 5,438-50 ft. and swabbing and drillstem tests recovered about 1 bbl. of fluid an hour. With the packer set at 5,428 ft., it was swabbed to within 400 ft. of packer, the fluid testing 40 per cent heavy oil and the balance wash water. Operators then reperforated at 5,438-46 ft. and continued swabbing.

Continental Oil Co. was reported to have joined the Sharkey Platform stratigraphic test play. Permits have been granted to drill two wells on the company's National Forest lease in Townships 10 and 11 North, Ranges 5 and 6 West, in Sharkey County. The first operation was said to be the 1 USDA-Holly Bluff, in SE NW 30-11n-5w, which would place it some 8 miles east of the abandoned Cary field. Second location is the 1 USDA-Spanish Fort, in NW SE 13-10n-6w, but it is not to be drilled until the first test is completed.

In Warren County, Amerada Petroleum Corp. 1 State, NW NE 16-18n-2e, cored 3,722-32 ft., recovering 1 ft. of sandstone, fossiliferous and having bubbles of dark brown oil

Bottom Water is a costly profit leak

Eagle Lead Wool

stops Bottom Water!

You rule out the risk of oil-wasting bottom water shutdowns when you tamp Eagle Lead Wool in the hole. This finely stranded, noncorrosive metallic wool makes a water-tight plug that seals every crack and crevice. Comes in convenient 50-pound sacks—easy to place in special cartridge-shaped Eagle Wire Containers sized to fit all casings. Order through your jobber today.

These 3 Eagle Bearing Metals meet most requirements

Eagle Dreadnaught—for extreme speed and heavy-duty conditions.

Eagle Outlasta—for medium speed and average-load conditions.

Eagle Durable—for low speed and light-duty conditions.

EAGLE LEAD WOOL

Seals off Bottom Water—keeps 'em flowing!

THE EAGLE-PICHER COMPANY

EAGLE Since EP 1843 PICHER

Cincinnati • East St. Louis
Chicago • Dallas • Kansas City

PRECISION-BUILT

WECO BLOCKS

SNARL-PROOF

Lines cannot foul between side plates and sheave

SHAKE-PROOF WASHERS

Shake-proof lock washers used throughout WECO Blocks.

HEAVY-DUTY

Tests show WECO Snatch Blocks carry working load of 12 tons

FORGED STEEL

Hook, trunnion and sheave in WECO Snatch Blocks are forged steel for maximum strength. ⅜" steel side plate.

FULL SWIVEL

Choice of full swivel hook, clevis or eye assembly

Greater convenience in use is coupled with maximum strength and flexibility in the design of forged steel WECO Blocks. For convenience, WECO's exclusive drop-side design allows you to reave the block without having the end of the line. Just unscrew the hinge plate wing nut, lift the side and string your line. For greater strength and flexibility in use, WECO's forged steel and heat treated hook provides extra width at the point of greatest load. Another member of the WECO Block family is the dependable tong line block, made for maximum strength and dependability. Precision built WECO Blocks pay off in longer, more dependable service. Specify WECO. Buy from your authorized distributor. Write for our new catalog.

Sold Through Leading Supply Stores

WELL EQUIPMENT MFG. CORP.

Subsidiary of Chiksan Company

Houston 1, Texas

Export Representation:

CHIKSAN EXPORT COMPANY

New York 7 Brea, Calif Houston 1

WECO

Manufacturers and Distributors of Oilfield, Refining, Marine and Industrial Equipment

and gas from a calcite vein. Additional cores at 3,732-42 ft. recovered very hard, sandy limestone and sandstone, having no porosity. Operators were drilling ahead below 3,792 ft.

Two miles northeast of Bentonia, Yazoo County, R. T. McDermott 1 Pauline Gaddis, 32-10n-1w, was drilling below 6,643 ft. in new sidetracked hole. Three miles north of Yazoo, Don Reese 1 W. T. Clark was drilling below 6,080 ft. Sand, with no shows, was found at 5,783-92 and 6,043-47 ft. In Hinds County, Continental Oil Co. 1 H. R. Bryant, 9-5n-4w, south of Edwards, was out of the hole to change bits at 5,302 ft., in hard sand and shale.

FLORIDA WILDCAT FAILURE

Holmes County: S. W. Breeding 1 N. E. Coats, SE NW 25-7n-15w, dry, TD 4,107 ft., Midway 1,395 ft., Navarro 1,885 ft., Selma 2,045 ft., Austin 2,615 ft., lower Austin 2,800 ft., Eutaw 2,952 ft., Tuscaloosa 3,115 ft., Marine Tuscaloosa 3,380 ft., Lower Tuscaloosa 3,646 ft., Massive sand 3,742 ft., Comanche 3,830 ft.

GEORGIA WILDCAT FAILURES

Applinc County: J. E. Weatherford 1 W. E. Bradley, Lot 522, Land Dist. 2, dry, TD 4,098 ft., top quartzite 4,095 ft., 8 sidewall cores recovered no shows.

Echols County: Hunt Oil Co. 3 Superior Pine Products Co., Lot 532, Land Dist. 13, dry, TD 4,000 ft. in quartzite.

MISSISSIPPI WILDCAT FAILURE

Smith County: Danciger Oil & Refining Co. 1 Smith County Oil Co., NW SW 2-1n-7e, dry, TD 8,407 ft., Wilcox 2,057 ft., Midway 4,650 ft., Eutaw 6,516 ft., first sand 6,531 ft., no shows, elev. 425 ft.

CANADIAN FIELDS

More Leduc Wells Nearing Completion

CHATHAM.—In the Leduc field, Imperial 6, LSD 1, 22-50-26w4, is finishing in Devonian limestone at 5,359 ft. after drill-stem tests at 5,339-59 ft. showed oil and gas. Its first test at the top of the second porous zone showed a gas flow, estimated 3,000,000 cu. ft. Imperial 7, LSD 4, 15-50-26w4, has run drill-stem tests showing some gas at intervals between 5,165-5,205 ft. in the second porous zone. It is an east offset to No. 2 producer. Imperial 10, LSD 11, 26-50-26w4, started primarily as a test for gas for drilling fuel encountered a flow in the Viking sand at 3,457 ft. and while swabbing to set casing blew in with 3,525,000 cu. ft.

Imperial 5, LSD 8, 21-50-26w4, after producing 105 bbl. on choke in 19 hours went off production, but after 24 hours came back and has finished at 5,100 ft., making between 80 and 86 bbl. with ⅛-in. choke, with tubing pressure 260 and separator 200 psi. Imperial 8, LSD 7, 26-50-26w4, is below 4,733 ft. New locations are Imperial 11, LSD 9, 21-50-26w4, and Imperial 12, LSD 12, 22-50-26w4.

Nearing completion is Okalta-Leduc 1, LSD 13, 7-50-25w4, east of production, and below 4,957 ft. B. A. Pyrcz, LSD 12, in 25-50-26w4, deepening below 4,882 ft. and, contrary to the original dip, logging 25 ft. lower than Imperial 3 producer. Globe-Leduc West 2, USD 9, 34-50-25w4, is below 4,750 ft. and between the first and second porous zones of the Devonian. Five other wells are drilling in the main field with eight locations.

South of the field, McColl-Frontenac Wizard Lake, LSD 14, 14-48-27w4, is coring below 5,308 ft. McColl-Frontenac Bigstone Creek, LSD 1, 20-46-26w4, is below 5,302 ft. and McColl-Frontenac East Wetaskiwin, LSD 3, 22-46-23w4, is coring below 5,168 ft. Production in any of these wells would extend the field considerably to the south and east.

Some 10 miles northwest of the Imperial-Leduc producers, Gulf Oil has spotted

a **Devonian test in LSD 14, 9-52-26w4,** on the Stony Plain Indian reservation.

Turner Valley.—In North Turner Valley Home-Millarville 25, LSD 3, 33-20-3w5, with Madison limestone at 8,175-8,756 ft., is re-acidizing the lower porous and looks like a good producer with the upper horizon still untested.

Lloydminster.—Net production from the Lloydminster field in June totaled 23,828 bbl. from 32 wells in Alberta and 49,152 bbl. from 45 wells in Saskatchewan, representing an average of 30 bbl. per day per well. In Alberta, Athlone 5, NW 6, 11-50-2w4, finished at 2,010 ft., is testing sand at 2,005 ft. Wells testing on the Saskatchewan side are: Barnhill 1, SE 12, 35-48-28w3, at 1,883-92 ft.; Crest 3, SE 11, 25-48-28w3, at 1,872-1,936 ft.; Hale 1, NW 13, 36-48-28w3, at 1,874-86 ft.; Lone Rock 3, SW 12, 6-47-26w3, at 1,760-1,855 ft. Six other wells are drilling and one rigging.

Steveville.—In the Steveville - Princess field, Standard Pacific, LSD 14, 8-19-11w4, bottoming at 3,346 ft. swabbed 7 bbl. an hour, and is being placed on the pump.

De Winton.—In the De Winton area, 12 miles south of Calgary and east of North Turner Valley, Royalite-De Winton 2, LSD 13, 24-21-1w4, is fishing at 7,780 ft., with first porous horizon expected around 7,840 ft.

Athabaska.—In the Perryvale district Decalta Petroleums 1, LSD 2, 27-63-23w4, is coring below 2,040 ft. after drill-stem tests in the Grand Rapids limestone showed oil and gas. Further drill-stem tests will be made before deepening to the Devonian limestone.

ROCKY MOUNTAIN

El Paso Natural to Drill Four Exploratory Tests

DENVER.—A recent announcement by Paul Kayser, president of the El Paso Natural Gas Co., that Western Gas Co., a producing subsidiary, had acquired a half-interest in approximately 300,000 acres of leases in the San Juan Basin in northwestern New Mexico, southwestern Colorado and southeastern Utah, and has contracted to drill four wells in the area, has aroused intense speculative interest. A big leasing campaign has been under way in this area for some time, and in recent months has extended farther north into San Miguel, Montrose, Delta and Mesa counties. While no official information is available as to the details of the Western Gas Co. deal, it is reported here that it was with Byrd-Frost, Inc., of Dallas, and that one of the four wells involved is the Boulder Knoll test in 1 Redd, C SE NE 23-34n-25e, San Juan County, Utah, which is now under way. The play farther north is mostly along the Uncompahgre uplift and other granite highs in the area. No location for tests in this northern play have so far been announced, but it is reported that Pure Oil Co. plans to drill on its block along the Dolores River near Gateway, in Mesa County, this year and J. M. Huber Corp. hopes to get its block on the Sinbad structure just south of the Pure block drilled at an early date.

Whitlash field extended.—The Whitlash field in Liberty County, Montana, in which most of the locations within the known producing area of the Blackleaf and Sunburst sands have been drilled, was extended ¾ mile to the northeast in a deeper sand in Western Natural Gas Co. 3 Iverson, CWL SE SE 3-37n-4e. Total depth is 2,857 ft., and estimated production is 5,000,000 cu. ft. gas per day with shut-in pressure of 760 psi. It had a small show of gas in the Blackleaf at 2,060 ft., estimated at 1,000,000 cu. ft. and a little gas in the Sunburst at 2,770-80 ft. The main gas sand, probably the Cut Bank, was topped at 2,832 ft. The 5½-in. was set at 2,470 ft. with 400 ft. of 4-in. liner. The well is 3 miles north of Union Oil Co. Mahoney Unit in 22-37-4e, which was drilled to 4,068 ft. in 1944 and had the top of the Devonian at 2,845 ft. and the Jefferson sand at 3,069 ft. There was a small show of oil in cores from the Devonian, but failed on a drill-stem test.

Horse Creek producer.—General Petroleum Corp. 76-X-31 Government, CSL NE SE 31-17n-68w, Horse Creek field, Laramie County, Wyoming, was completed at 5,388 ft. for 150 bbl. per day pumping, the oil testing 31.5° gravity. Top of the Muddy was at 5,139 ft., the Dakota at 5,300 ft., and the Lakota at 5,323 ft. The 7-in. was set at 5,336 ft. Horse Creek, which is located on the northwest rim of the Julesburg basin, was discovered in 1942, and as a result a big leasing play developed in the basin. However, the discovery well pumped only 30 bbl. per day after plugging back to Lakota from total depth of 7,457 ft. The other wells were drilled to the Dakota sands but proved to be small producers. Recently the operator moved in to make further tests and develop the field. Total production last year was 15,000 bbl. The oil is trucked to Cheyenne refineries. A north offset to latest completion is now drilling.

Tensleep well at Quealy.—California Co. 5 Wilson, C W½ SW 18-17n-76w, Quealy field, Albany County, Wyoming, was completed at 5,592 ft., and pumped 510 bbl. in 24 hours. Top of Tensleep was at 5,318 ft. Location is ½ mile east of 2 Holst, which was a discovery in a deeper horizon early this year, pumping 278 bbl. in 24 hours from the Tensleep. The second well ran more than 150 ft. higher on the Tensleep than the discovery.

Maudlin Gulch test.—Texas Co., under an option from Frontier Refining Co., is going into Frontier 1 Unit, NE N WNW 35-4n-95w, Maudlin Gulch, Moffat County, Colorado, and perforate casing and test show of oil in the Morrison sand. Frontier suspended operations on the well in 1945 when water was swabbed from the Sundance

Positive Vapor Control with
BS&B VENT VALVES

Here's positive protection against vapor loss when storing benzol, alcohol, gasoline and other products requiring slight pressure for economical storage. B S & B Vent Valves guard against both over-pressure and excessive vacuum. Over-pressure lifts the hinged cover, breaks the seal, allows vapors to escape until normal pressure is restored. Excessive vacuum causes atmospheric pressure to lift the gasket, permitting in-breathing.

Specifications to fit your venting requirements:
Sizes 2" to 24"; Standard opening pressures, 3 to 1½ oz.; Maximum opening pressures, 16 to 4 oz.; Standard opening vacuum, ½ oz. Bodies, Covers, Gaskets, in wide variety of metals and materials.

Call your nearest B S & B Sales Engineer today! Or write to Special Products Division, Black, Sivalls & Bryson, Inc., Power and Light Building, Kansas City 6, Missouri.

FOREIGN INQUIRIES INVITED — EFFICIENCY RELIABILITY — Cable Address: BLACK, KANSAS CITY, U.S.A.

BLACK, SIVALLS & BRYSON, INC.

KANSAS CITY, MO. CASPER, WYO. — OKLAHOMA CITY, OKLA. CALGARY, ALTA.

after squeeze job failed. The Sundance was perforated at 6,286-94 ft. Top of Morrison was at 6,155 ft. If test proves satisfactory, Texas Co. will drill a second well under an option to acquire a one-half interest in the block. The location is 7 miles northwest of the Wilson Creek field which produces from the Morrison and Sundance sands.

WILDCAT FAILURES IN COLORADO

Poose Creek, Rio Blanco County: Phillips Petroleum Co. 1 Government, SE NW SE 10-2n-88w, TD 7,429 ft., dry and abd. Top Triassic red beds 705 ft., Shinarump 1,290, Weber 2,045, Madison 6,330, Devonian 7,270(?), Cambrian 7,378 ft., elev. 9,226 DF.

Rattlesnake Butte, Las Animas County: Skelly Oil Co. 1 Weiland Merc. Co., SE SE SE 19-26s-62w, TD 1,496 ft., stratigraphic test abd. No tops available.

SUCCESSFUL WILDCAT COMPLETION IN MONTANA

Whitlast, Liberty County: Western Natural Gas Co. 3 Iverson, CWL SE SE 3-37n-4e. TD 2,857 ft., est. 5,000,000 cu. ft. gas in Cut Bank sand, top at 2,832 ft., SI pressure 760 psi. Sunburst 2,770-80 ft. Extension and deeper pay.

SOUTHWEST TEXAS

Kleberg County Discovery Flows 73.9 Bbl. Oil

CORPUS CHRISTI.—A new oil field for Kleberg County has been opened by Stanolind Oil & Gas Co. 2 J. O. Johnson, located 3½ miles southeast of Kingsville. On potential gage flowed 73.91 bbl. of 43-gravity oil per day through 3/16-in. choke. Total depth is 9,798 ft., and production is through perforations at 6,040-46 ft., with gas-oil ratio of 2,832, and tubing pressure of 525 psi., casing sealed. This well tested good for gas-condensate production in perforations at 7,830-36 ft., 7,738-44 ft., and 7,440-46 ft., and also tested oil, gas, and some salt water in a series of perforations at the 6,186-96-ft. level.

Jay Simmons et al 1 First National Bank of Mission, is a new oil field discovery in northeastern Starr County, 3 miles north of the La Reforma field. On drill-stem test open 14 hours through ¼-in. chokes through perforations at 6,421-27 ft. this well flowed 8 to 9 bbl. of oil per hour with 1,750 psi working pressure. Gravity of oil 44°. Operators are now waiting on potential gage. The well also had flowed about 6 bbl. per hour through perforations at 6,112-17 ft. and it was reported that dual-completion might be attempted in this pay. Total depth is 7,505 ft., with 5½-in. casing set to 6,504 ft.

W. B. and Jewel Osborn and Mid-Continent Petroleum Co. 1 John Clopton, wildcat in southeastern Starr County, 6½ miles east of Rio Grande City, is shut in after flowing gas through perforations at 5,660-5,700 ft. First production test through perforations at 4,025-45 ft. tested dry. Second test through perforations at 4,430-50 ft. recovered gas-cut mud with 1,660 psi. bottom-hole pressure. These perforations were squeezed, and new perforations made at 5,660-5,700 ft. where 6-hour drill-stem test developed 125 psi. working pressure through ¼-in. chokes and flowed gas. Total depth is 6,256 ft., with 5½-in. casing at 6,035 ft. This well is in Lot 19, Block 2, B&B Oil Co. Subd., in Porcion 86.

A new pay for Midway field, San Patricio County, has been opened by F. M. Boykin, Jr. 10 Jones, in Section 72, Paul's Subd. of C.F.P. Co. lands. On potential gage through perforations at 5,045-47 ft., flowed 122 bbl. of 29°-gravity oil per day through a ½-in. choke, with gas-oil ratio 1,968, tubing pressure 1,400 psi., casing pressure 2,100 psi. Total depth is 5,134 ft., and top of pay 5,044 ft.

Magnolia Petroleum Co. 2 Duval Ranch-State, Section 76, is new oilfield discovery in "76" field area, 2 miles south of Casa Blanca field, and on potential test pumped 67 bbl. of oil per day, gravity 18.7°. Total depth is 1,329 ft., and production is through perforations at 1,322-27 ft.

SOUTHWEST TEXAS SUCCESSFUL WILDCATS

Duval County: New oil pool—Magnolia Pet. Co. 2 Duval Ranch-State Section 76, in CCSD&RGNG Sur. 76, 6 mi. NW of Freer, 2 mi. S of Casa Blanca field and 4 mi. W of Government Wells field, top pay 1,322 ft. (Cole sand), TD 1,329 ft., perf. 1,322-27 ft., IP: 67 bbl. oil per day on pump, gas-oil ratio low, gravity 18.7°, no water.

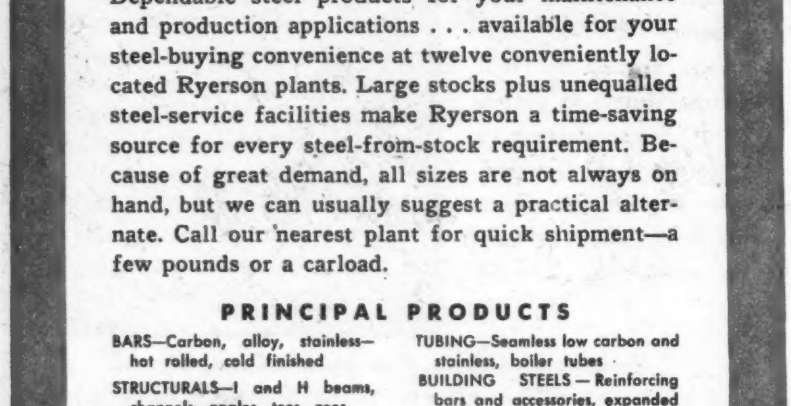
Kleberg County: New oil pool: Stanolind Oil & Gas Co. 2 J. O. Johnson, in Kleberg Town & Impr. Co. Subd., Rincon de Santa Gertrudis Grant, 3½ mi. SE of Kingsville and 1½ mi. NW of Ricardo field, TD 9,798 ft., perf. 6,040-46 ft., IP: 74 bbl. oil per day through 3/16-in. choke, gas-oil ratio 2,832, TP 525 psi., casing sealed, gravity 43°, no water.

New oil pay, Borregas pool—Humble Oil & Refg. Co. 15 King Ranch-Borregas, in Santa Gertrudis Grant, TD 7,500 ft., perf. 5,148-55 ft., IP: 99 bbl. oil per day through a ⅛-in. choke, gas-oil ratio 630, TP 860 psi., casing sealed, gravity 42°, no water.

San Patricio County: New oil pay Midway pool—F. M. Boykin, Jr., 10 C. V. Jones, in Section 72, Geo. H. Paul's Subd. of Coleman-Fulton Pasture lands, top pay 5,044 ft., TD 5,134 ft., perf. 5,045-47 ft., IP: 122 bbl. oil per day through ⅛-in. choke, gas-oil ratio 1,968, TP 1,400 psi., CP 2,100 psi., gravity 29°, no water.

SOUTHWEST TEXAS WILDCAT FAILURES

McMullen County: Newman Bros. and Skinner & Eddy Corp. 1-AA South



Dependable steel products for your maintenance and production applications . . . available for your steel-buying convenience at twelve conveniently located Ryerson plants. Large stocks plus unequalled steel-service facilities make Ryerson a time-saving source for every steel-from-stock requirement. Because of great demand, all sizes are not always on hand, but we can usually suggest a practical alternate. Call our nearest plant for quick shipment—a few pounds or a carload.

PRINCIPAL PRODUCTS

BARS—Carbon, alloy, stainless—hot rolled, cold finished
STRUCTURALS—I and H beams, channels, angles, tees, zees
PLATES—Including Inland 4-Way Floor Plate
SHEETS—Including Allegheny Stainless
TUBING—Seamless low carbon and stainless, boiler tubes
BUILDING STEELS—Reinforcing bars and accessories, expanded metal
MACHINERY & TOOLS—for metal working
OTHER PRODUCTS—Chain, wire rope, Babbitt metal, etc.

JOSEPH T. RYERSON & SON, INC.

Plants: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles

Texas Synd., in J. Fitzpatrick Sur. 20, 1 mi. E of N end of Greens Branch field, 12 mi. S-SE Fowlerton, dry, TD 3,958 ft.

Nueces County: Southern Minerals Corp. 1 W. E. Baxter, in J. V. L. de Herrera Grant, 7 mi. NW of Robstown and 1¼ mi. SW of East Riverside field, dry, TD 7,202 ft.

Travis County: Gerhard Ohlendorf, W. P. Wolter and Otto A. Wolter 1 Martin Lundgren, in Kimbro Sur., 6 mi. NE of Manor, dry, TD 1,805 ft.

Zapata County: Texon Drlg. Co. 1 Encarnacion G. de Ramos, in Porcion 16, Share A-1, 8 mi. NE of Falcon, dry, TD 3,055 ft.

OKLAHOMA

Low Gravity Oil Discovery In Murray County at 1,500 Ft.

SOHIO OIL CO. 1 Purtle, SE SE NE 23-1n-2e, opens low gravity pool in Murray County. The well swabbed 15 bbl. 16°-gravity oil per hour for 7 hours from McLish sand topped at 1,490 ft. which showed over 50 ft. of saturation. Hole was drilled to 1,564 ft. and plugged back to 1,545 ft. Pipe was set on top of the McLish. This is the first oil production in Murray County and makes that county the 48th in the state to produce oil.

Ohio Oil Co. 3 Woods, SE SW NE 17-3n-5w, Grady County, the south offset to the discovery well in the Dornick Hills sand in the old Knox pool, flowed 800 bbl. oil on a 12-hour test through 1-in. choke from perforations at 4,117-44 ft. and 4,168-98 ft.

At the northwest edge of the Knox pool, Ohio Oil Co. 1 Tims, SE SE NW 6-3n-5w, from perforations at 4,343-83 ft., made 116 bbl. oil on a 9-hour swabbing test, flowed 5 bbl. per hour for 2 hours and then died. Operators contemplate putting well on gas-lift. The Tims well is a northwest diagonal offset on 40-acre spacing to a recent gas well completion by the same company.

Sinclair Prairie 1 McDaniel, SE SE 35-5n-4w, which extends the East Lindsay pool ¾ mile west and ¼ mile north into McClain County, flowed 152 bbl. oil in 7½ hours, accompanied by gas flow of 3,100,000 cu. ft. per day on drill-stem test at 10,395-436 ft. This is the third interval successfully tested for oil, as well made 958 bbl. in 24 hours through 26/64-in. choke from test at 10,309-349 ft., and made 570 bbl. through 5/16-in. choke from test at 10,203-31 ft. Operators are drilling ahead with tools below 10,439 ft.

Carter Oil Co. 1 Randolph, SE NW 5-1n-1w, Garvin County, showed gas volume of 6,000,000 cu. ft. per day in 5 minutes and flowed oil in 33 minutes estimated at 6 bbl. per hour on drill-stem test from 6,116 ft. to bottom of hole at 6,219 ft. Top of Mayes lime was logged at 6,207 ft.

Superior Oil Co. 51-11 Weller, 11-8n-12w, Caddo County, the world's deepest well, is still testing, and no official report has been made to indicate that oil has been found in commercial quantities.

Gulf Oil Corp. 1 Ida, NW NE NW 4-4n-6w, Grady County, has pipe set 1 ft. off bottom at 11,660 ft. and is drilling out plug.

Magnolia Petroleum Co. 1 Winter, SW NE 9-19n-20w, Dewey County, drilled to 12,966 ft., and is running electric log.

Phillips Petroleum Co. 1 Chapman, NW SE NW 1-10n-4e, Pottawatomie County, swabbed 3 bbl. oil per hour from Bartlesville topped at 4,124 ft. Total depth is 4,138 ft.

L. G. Wheeler et al 1 Soric, NW NW NW 19-19n-4e, Payne County, swabbed 140 bbl. oil in 5 hours from perforations at 3,800-20 ft. Bartlesville was topped at 3,718 ft., Mississippi at 3,995 ft., and Wilcox at 4,245 ft. Total depth is 4,281 ft.

OKLAHOMA SUCCESSFUL WILDCATS

Cotton County: Nixon Petroleum and W. L.U. Drilling 1 Warren, NE NE SE SE 1-5s-13w, pumped 13 bbl. of 40°-gravity oil per day from Megargel lime at 1,596-1,616 ft., no other tops reported.

Kay County: Dave Morgan and Kay County Gas 1 Lambding, NW NW NE 28-29n-1e, produced 15 bbl. of oil per day from 3,070-3,121 ft., TD 3,436 ft.

Lincoln County: Texas Co. 1 Ida Carter, NW SW NE 25-17n-2e, produced 322 bbl. oil per day from 4,505-18 ft., TD 4,795 ft.

Logan County: New pay in West Edmond—Stanolind 2 R. N. Christner, C SE NE 30-15n-4w, IP 5,000,000 cu. ft. of gas from Bartlesville at 6,520-60 ft., (dual completion—flowed 13 bbl. oil from Hunton, and gas from Bartlesville, no change in Hunton), Harrington 6,858 ft., TD 6,887 ft.

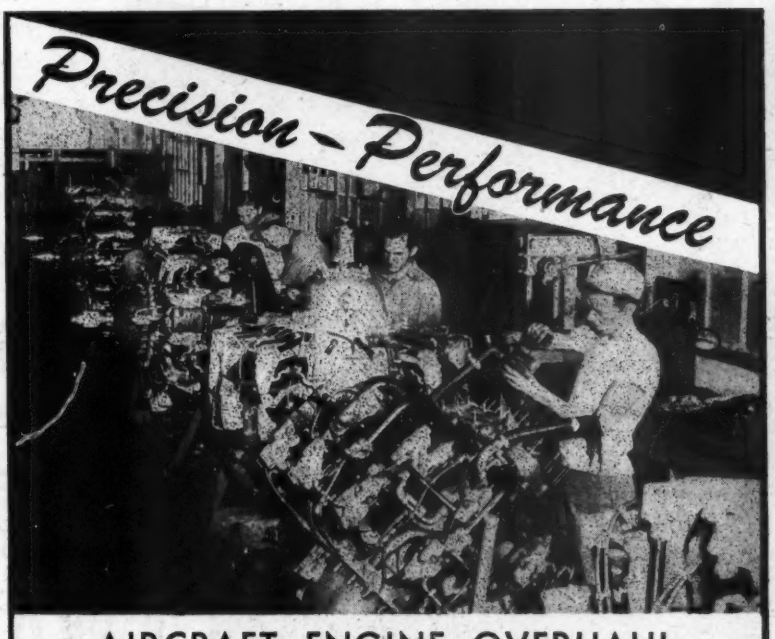
Noble County: Extension to Fourdee—Grisso Royalty 1 Seids, SE NW NE 29-22n-1w, flowed 34 bbl. of oil per day from Mississippi lime at 4,740-95 ft., through 10/64-in. tubing choke, Avant 3,310 ft., Layton 3,660 ft., Oswego 4,235 ft., TD 4,877 ft.

Oklahoma County: Big Chief Drilling 1 Davis, SE NE SW 22-13n-1e, flowed 65 bbl. of oil per day from conglomerate at 4,655-64 ft., Hogshooter 4,097 ft., Checkerboard 4,406 ft., TD 4,675 ft., extension to NE Jones.

OKLAHOMA WILDCAT FAILURES

Carter County: Sullivan Brothers et al 1 Clyde Minter, NE NW NW 9-5s-1e, dry, TD 1,432 ft., sand 428-70 ft., Sylvan 830 ft., Viola 1,428-32 ft.

Continental 1 Richard Milroy, SE SE SW 6-3s-1w, dry, TD 7,177 ft., lime 3,600-08 ft., gray shale 4,637-4,900 ft., limy sand



AIRCRAFT ENGINE OVERHAUL

for your

Executive and Company Planes

demands nothing less than Dallas Aero experience . . . precision . . . dependability.

- COMPLETE CONVERSION
- REFITTING - EQUIPPING
- SERVICE AND REPAIRS
- ENGINE CHK., OVERHAUL
- INSTRUMENT SERVICE

CAA Certified Repair Station No. 168

Dallas Aero Service

A DIVISION OF HARRY M. CHASE, INC.

Love Field • DALLAS, TEXAS • Ph: D 4-2641

DIFFERENTIAL PRESSURE THRU TRAP, POUNDS PER SQUARE INCH
CONTINUOUS FLOW CAPACITY IN POUNDS OF CONDENSATE PER HOUR
239
237 & 337
235 & 335
233 & 333

Capacities TO 300,000 LBS. PER HOUR!

ARMSTRONG *Piston Operated* COMPOUND TRAPS

Here's the trap for handling huge amounts of condensate in the refinery or in the field! Capacities to 300,000 lbs. per hour . . . cast semi-steel bodies for pressures to 250 psi., . . . forged steel for pressures to 900 psi. or all-steel installations. For complete information, send for Catalog H. Armstrong Machine Works, 868 Maple St., Three Rivers, Mich.

ARMSTRONG

MANUFACTURERS OF ARMSTRONG INVERTED BUCKET STEAM TRAPS

TOUGH and TRUE TURNBUCKLES *by Norris Brothers, Inc.*

HUNDREDS OF THOUSANDS IN USE ALL OVER THE WORLD . . .

• Norris Brothers Turnbuckles are made perfectly true by a special straightening process. Ends are tapped in line, assuring true concentric pull. And as for toughness, we've turned them inside out and twisted them into a pigtail braid without a sign of fracture. Made in sizes and types to fit most needs. Ask your supplier, or write for circular.

Norris Brothers, INC.
ROBINSON · ILLINOIS

Do you have these

WALL MAPS?

PIPE LINE WALL MAP OF THE U. S.— 31 x 48 inches, printed in four colors. Shows all the crude oil and products trunk lines in the U. S. with the names of the owners given in each case. Published September, 1946. Price $1.00.

JOURNAL GUIDE TO WORLD OIL— 36 x 48 inches, printed in four colors. A handsomely illustrated map of the world, showing the various oil producing areas, refineries, pipe line and tanker routes, surrounded by enlarged maps of the major oil producing countries with important facts and figures. Published January, 1947. Price $1.50.

JOURNAL GUIDE TO GULF COAST OIL— A handsome 36 x 48 in. wall map printed in five colors. Shows locations of all oil and gas fields, all refineries, the inland waterways system, and other facilities. Carries a complete list of the Gulf Coast oil and gas fields, a list of refineries by towns, a list of the natural gasoline and cycling plants by fields, and a list of terminals. Published May 31, 1947. Price $1.50.

Send your order and payment direct to

THE OIL AND GAS JOURNAL
P. O. Box 1260 **Tulsa, Oklahoma**

4,911-19 ft., hard cherty limy sand 4,953-70 ft., sand 6,879-89 ft.

Cleveland County: Big Chief Drilling Co. 1 Magers, C SW NW 1-7n-1w, dry, TD 7,352 ft., Bartlesville 6,354 ft., Hunton 6,459 ft. with stain of oil, Sylvan 6,810 ft., Viola 6,860 ft., Wilcox 7,234 ft., second Wilcox 7,268 ft.

Cotton County: D. H. Bolin et al 2 Clampitt, NE NE NE SW 13-5s-12w, dry, TD 2,012 ft., sand 1,060-69 ft., Megargel lime and shale 1,793-1,837 ft.

Paul B. Scott et al 1 Young, NE NE NE SE 9-5s-12w, dry, TD 2,102 ft., sand shale 1,381-1,415 ft., sand 1,694-1,716 ft. and 1,770-1,802 ft., Megargel lime 1,802-15 ft.

E. P. Griffen 2 Malcolm, NE NE SE NE 2-5s-10w, dry, TD 1,197 ft., no tops reported.

C. A. Johnston 1 Waller, SW SW NE NE 35-4s-10wm, dry, TD 1,760 ft., sand 910-26 ft. and 1,013-16 ft., soft shaly sand 1,016-28 ft., hard sand 1,090-1,110 ft., hard broken lime 1,298-1,330 ft., hard sand 1,486-91 ft. and 1,532-1,608 ft., no shows.

Amerada 1 Flippins, SE SE SE 14-3s-12w, dry, TD 1,615 ft., no tops reported.

Bridwell 1 Jones, C W/2 W/2 SE NW 22-3s-11w, dry, TD 1,516 ft., sand 1,270-76 ft., white sand 1,390-96 ft., conglomerate 1,402-13 ft. with slight show of gas, sand 1,413-38 ft., broken sand 1,510-13 ft., with a show of oil.

Bridwell Oil 1 Buchanan, C N/2 N/2 SW SE 31-3s-10w, dry, TD 1,437 ft., sand 1,372-85 ft.

Creek County: Curt Edgerton et al 1 Estate Land Co., NW SE NW 27-19n-9e, dry, TD 2,888 ft., Oswego 1,780-1,825 ft., Lower Oswego 1,828-32 ft., broken sand 1,870-1,915 ft., lime 1,915-25 ft., sand 1,940-60 ft., lime 2,252 ft., Bartlesville 2,294 ft. with slight show of oil and gas, Mississippi lime 2,590 ft., Wilcox 2,872 ft. with slight show of oil.

E. P. Baker 1 McCrory, NE NW SW 11-18n-9e, dry, TD 3,103 ft., Bartlesville 2,475 ft., Mississippi lime 2,757 ft., Woodford 3,070 ft., Wilcox 3,101 ft.

Lincoln County: Texola and Four States 1 Embry,SE SE SW 18-15n-5e, dry, TD 3,570 ft., Hogshooter 2,405 ft., Upper Layton 2,440-50 ft., Lower Layton 2,475 ft., Checkerboard 2,770 ft., conglomerate 2,815-30 ft., Oswego 3,421 ft., Prue 3,486 ft., sand 3,508-22 ft., Verdigris 3,525 ft.

Mid-Continent 1 School Land, SW SW NW 36-13n-6e, dry, TD 4,325 ft., Hogshooter 1,670 ft., Layton 1,820 ft., Checkerboard 2,070 ft., conglomerate 2,140 ft., Oswego 2,983 ft., Prue 2,989 ft., Bartlesville 3,751 ft., Woodford 4,143 ft., Misener 4,213 ft., Hunton 4,214 ft., Sylvan 4,299 ft.

Logan County: Harper-Turner et al 1 Hower, C NE SW 29-15n-2w, dry, TD 6,456 ft., Oswego 5,600 ft., Bartlesville 5,844 ft., Mississippi lime 5,873 ft., Woodford 5,910 ft., Hunton 6,020 ft., Sylvan 6,038 ft., Viola 6,140 ft., dense 6,194 ft., Wilcox 6,275-6,309 ft., second Wilcox 6,362 ft.

Eason 1 C.O.L., C NW NW 16-15n-1w, dry, TD 6,075 ft., Hogshooter 4,437 ft., Layton 4,478, Oswego 5,150 ft., Prue 5,275-88 ft., Bartlesville 5,380 ft., Mississippi lime 5,483 ft., Woodford 5,510 ft., Hunton 5,611 ft., Wilcox 5,910 ft., second Wilcox 6,022 ft.

Okfuskee County: Smith Horton Drilling 1 Miller, NW NE NE 16-12n-7e, dry, TD 4,051 ft.

Oklahoma County: W. E. Anderson 1 Johnson, SW SW SW 20-14n-1w, dry, TD 6,053 ft.

Pottawatomie County: Harper-Turner and Phillips 1 Stasta, SE SE NW 17-11n-5e, dry, TD 4,960 ft., Hogshooter 2,370 ft., Wewoka 3,034 ft., Oswego 3,520 ft., Upper Prue 3,525 ft., sand 3,668-93 ft., Earlsboro 3,975 ft., no Bartlesville, Basal Pennsylvanian-Mississippian 4,305 ft., Mayes 4,430 ft., Woodford 4,620 ft., Misener 4,685 ft., Hunton 4,687 ft., Sylvan 4,725 ft., Viola 4,815 ft., dense 4,855 ft., dolomite 4,870 ft., Wilcox 4,888-95 ft., second Wilcox 4,897 ft.

This "Rubber" Hose is 67% steel!

716 lbs. of steel for strength—354 lbs. of rubber and fabric for flexibility—that's the efficient make up of Thermoid Powerflex Rotary Hose, built to go "all the way" in deep hole drilling!

Thirty-three *miles* of high tensile steel wire, formed into 9300 ft. of cable, and precision wrapped—and counter-wrapped, gives each length of Thermoid Powerflex Rotary Hose strength to withstand the highest pressures that may develop under any condition.

The advantages of flexibility are retained in the 354 lbs. of rubber and fabric that house the steel cable. The neoprene tube resists abrasion even better than a steel tube, and the flexibility needed for rotary work is obtained in a single, unbroken, free-flowing length of hose.

Thermoid Powerflex Rotary Hose has the strength *of steel—and the* flexibility *of rubber!*

Thermoid Products

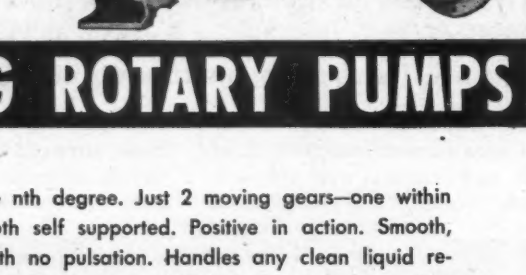
Automotive • Industrial

Oil Field • Textile

Thermoid Company, Trenton, N. J., U. S. A.

Warehouses in Houston, Los Angeles, Wabash

Here's the Works! ...in



VIKING ROTARY PUMPS

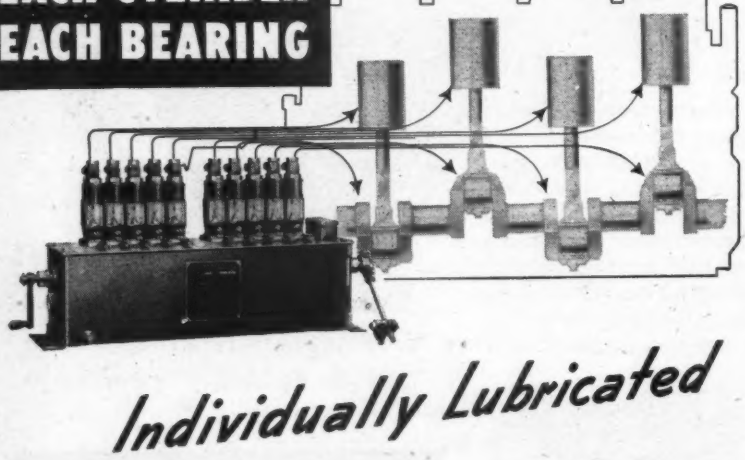
Simple to the nth degree. Just 2 moving gears—one within the other. Both self supported. Positive in action. Smooth, even flow with no pulsation. Handles any clean liquid regardless of viscosity. Low speed. Full, fast delivery. Long life. Complete line of models and sizes with pressures ranging from 5 to 500 psi. depending on style of pump.

If it is your job to see that liquids are moved, see Viking for the answer. Write today for the folder that will help you — 47ST.

See Our Catalog In SWEETS

VIKING PUMP COMPANY
CEDAR FALLS, IOWA

EACH CYLINDER EACH BEARING



Individually Lubricated

BY faithfully delivering precise amounts of oil to cylinders, bearings, and other points of friction, Manzel Lubricators save engine owners up to 60% in reduced oil consumption and lowered maintenance costs. Write for further information.

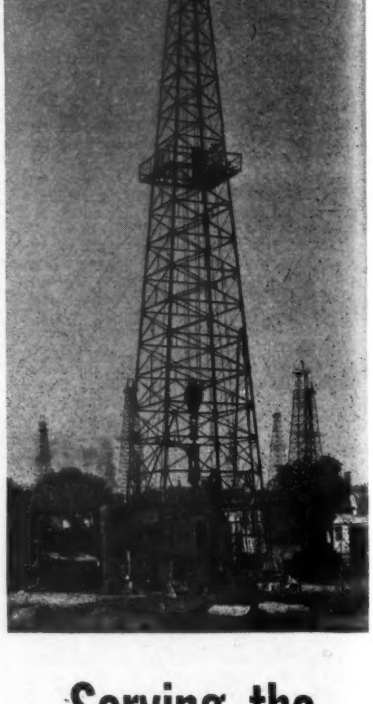
Manzel Inc. now supplies repair parts for all models of Bowser and Torrington Lubricators.

Builders of HIGH PRESSURE METERING PUMPS Since 1898

Manzel INC.

A Subsidiary of Frontier Industries, Inc.
336 Babcock Street Buffalo 10, N. Y.

STROM STEEL BALLS



Serving the Oil Well Industry

As an integral part of rotary tables, working barrels, rock drills and swivels in derrick assemblies, Strom Steel Balls are constantly serving in the production effort of the oil and gas industry. Write for catalog. Strom Steel Ball Co., 1850 South 54th Ave., Cicero 50, Illinois—Pacific Coast Representative: Precision Bearings, Inc., 1706 South Grand Ave., Los Angeles 15, California.

Strom
LARGEST INDEPENDENT and EXCLUSIVE METAL BALL MANUFACTURER

PERMIAN BASIN

Ellenburger Discovery Flows 1,232 Bbl. Per Day

MIDLAND.—Sinclair Prairie Oil Co. and Atlantic Refining Co. 1-66 University, major Ellenburger discovery in northeastern Crockett County, 8½ miles northeast of the Todd Deep field, took a 3-hour potential test through perforations at 7,530-75 ft., and flowed at the rate of 1,232 bbl. of oil a day. The flow was through ½-in. tubing choke, on a tubing pressure of 1,350 psi., and casing pressure of 2,000 psi. Total depth of the well is 7,680 ft., plugged back to 7,650 ft.

A previous test, from 7,530-7,575 ft., flowed 70 bbl. of oil an hour for 4 hours, through ¾-in. choke on tubing. On a ½-in. choke the well then flowed 727 bbl. of oil in 15 hours, with a gas-oil ratio of 2,000:1, and shut in to await potential gage. Location of the discovery is on a block of 2,492½ acres, for which Sinclair Prairie paid a record bonus of $910,000 at the December 1946 auction of leases on University of Texas lands. Later Sinclair sold a half interest to Atlantic. Sinclair drilled the well. The Ellenburger pay section continued to thicken in Humble Oil & Refining Co. 1 Elizabeth Mitcham, 14 miles northeast of Ozona, and 12 miles east and slightly south of Sinclair's discovery. First tests, from 8,120-40 ft. yielded 10 ft. of oil and 20 ft. of oil and gas-cut mud, then a retest of the section recovered 60 ft. of oil and gas-cut mud. Operators then cored ahead below 8,140 ft. to determine extent of the pay section.

So far the main producing section of the Ellenburger is 8,097-8,120 ft., where the well flowed gas in 3 minutes, and oil in 29 minutes. It was allowed to flow into pits for 8 minutes before being turned into tanks, for 1 hour, when it made 41.7 bbl. of 40.4°-gravity oil an hour. Gas-oil ratio was 974:1.

In Ector County, Gulf Oil Corp. was running electric surveys before deepening its Ellenburger discovery in the Goldsmith field. The 430-E Goldsmith, Section 15, Block 44, T&P Survey, had total depth at 9,520 ft. A drill-stem test, with packer at 9,493 ft., gas came to the surface in 7 minutes, and oil in 31 minutes. It put 36.8 bbl. of 42.5°-gravity oil into tanks in 30 minutes. Gas-oil ratio was 444:1. Operators estimated an additional 6,000 ft. of oil was unloaded when drill pipe was pulled. The 430-E. Goldsmith had top of the Ellenburger at 9,495 ft., on an elevation of 3,127 ft., placing it 205 ft. higher on structure than Gulf's 421 Goldsmith, Devonian discovery ¾ mile to the southeast, which had sulfur water in the Ellenburger. The 421 Goldsmith was also 250 ft. higher on the Simpson.

Linking of the Goldsmith Clear Fork and Andector fields was expected at Phillips Petroleum Co. and The Texas Co. 1 McEntire, Section 18, Block 44, T&P Survey. A 90-minute drill-stem test at 6,125-6,200 ft. brought gas to the surface in 4½ minutes, mud in 12 and oil in 20 minutes. It was allowed to flow into pits to clean itself, and then tanked 27 bbl. of oil in 1 hour. Location of the well is midway between the two fields, with no dry holes on either side, and it was said to be running flat structurally with nearest production in each field. Operators were to core ahead for additional pay section.

Argo Oil Corp. 1 Dora Roberts, southeastern Reeves County wildcat which touched off an extensive lease play in the spring of 1946 by flowing oil intermittently from a record depth in the Delaware Basin, has been completed as a Wolfcamp discovery, in pay streaks from 9,917 to 10,086 ft. Oil is 43.3°-gravity, and gas-oil ratio is 650:1. No water was reported in the potential gage. Drilling was started June 30, 1945. Top of the Wolfcamp was 9,775 ft., on an elevation of 2,880 ft., and total depth was 14,073 ft., plugged back to 10,860. Application has been made to the Railroad Commission for discovery allowable and a field designation as opener of the Verhalen pool. Location is 13 miles northeast of Balmorhea. Nearest production is in the Chancellor field in western Pecos County, 20 miles to the southeast.

WEST TEXAS WILDCAT FAILURES

Gaines County: Anderson Prichard Oil Corp. 1 P. W. Dalmont, Sec. 3, Blk. A-22, PSL Sur., 2 mi. E Robertson field, dry, TD 5,000 ft., Rustler 1,883 ft., Yates 2,900 ft., first limestone 3,980 ft., elev. 3,275 ft.

Hockley County: Amerada Petroleum Corp. 1 W. B. Beakley, Lab. 12, Lodge 734, State Capitol Lands, 3 mi. NE Levelland, dry, TD 5,017 ft., San Andres 3,990 ft., elev. 3,532 ft.

L. H. Wentz 1 E. T. O'Daniel, Sec. 3, Blk. 30, T&L Sur., 8 mi. NE Coahoma, dry.

(Continued on page 156)

ILLINOIS

Good Aux Vases Well In Johnsonville Area

MATTOON.—Puritan Drilling Co. et al 1 Spicer, NW NW SW 24-1n-5e, Wayne County, has been completed with initial production of 200 bbl. oil and 65 bbl water. Production is from Aux Vases sand at 2,957-73 ft. The test is 3 miles west of the Johnsonville Consolidated pool and 1 mile south of the West Johnsonville pool.

Sohio Petroleum Co. 1 Lynch, NE NE NE 32-8s-10e, Gallatin County, flowed 156 bbl. oil in 11 hours after treatment with 3,000 gal. acid in Lower Renault at 2,757-73 ft. Total depth is 2,790 ft. The well is about 1½ miles from production.

Activity in Illinois is sustained at a rela-

Install Them and Forget Them!
AMERICAN
RADIAL
Roller Bearings
AMERICAN RADIAL ROLLER BEARINGS are engineered to exacting standards that result in better performance and minimum maintenance.
Furnished in 5 styles, 6 S.A.E. series and 85 sizes. Special designs also available. Write.
AMERICAN
ROLLER BEARING CO.
420 Melwood Street
Pittsburgh, Pa.
Pacific Coast Office:
Los Angeles, Calif.

tively high level. Completions total 53 for the past week, including 26 oil wells and 27 dry holes. Operations started during the week total 58, including 15 wildcats.

ILLINOIS SUCCESSFUL WILDCATS

Clay County: E. A. Obering 1 Armstrong, NE NE SE 20-3n-7e, IP 110 bbl., McClosky 2,977-82 ft., TD 2,994 ft., Barlow 2,619 ft., Ste. Genevieve 2,945 ft., Fredonia 2,970 ft.

Marion County: J. H. Gilliam 1 Ebe, NE NE NW 14-2n-4e, IP 232 bbl., McClosky pay 2,756-63 ft.; 2,878-86 ft., TD 2,886 ft., acid 1,000 gal., Benoist 2,605 ft., Ste. Genevieve 2,707 ft., Fredonia 2,750 ft., McClosky 2,756 ft.

ILLINOIS WILDCAT FAILURES

Clay County: Paul Doran 1 Kessler, SW NE NW 4-4n-8e, dry at 3,077 ft., Benoist 2,841 ft., Aux Vases 2,943 ft., Rosiclare 2,992 ft., McClosky 3,017 ft.

Alan Borden 1 McCawley, SW SW NW 17-3n-7e, dry at 3,062 ft., Fredonia 2,967 ft., McClosky 3,017 ft.

Cumberland County: R. S. Hayes 1 McMullen, SE SE SW 3-10n-7e, dry at 2,270 ft., Tar Springs 1,725 ft., Cypress 1,977 ft., Aux Vases 2,188 ft., Rosiclare 2,188 ft., McClosky 2,224 ft.

Jasper County: National Associated Oil Co. 1 Walk, NW NW SE 13-8n-8e, dry at 2,970 ft., Glen Dean 2,335 ft., Barlow 2,459 ft., Lower Renault 2,711 ft., Ste. Genevieve 2,767 ft.

Jefferson County: Fryer and Simpson 1 Burke, SE SE NW 22-2s-3e, dry at 2,958 ft., Glen Dean 2,230 ft., Barlow 2,447 ft., Aux Vases 2,708 ft., Ste. Genevieve 2,768 ft.

Lawrence County: Dee Miller Drilling Co. 1 Marsh, NE NW NW 19-2n-11w, dry at 1,963 ft., Glen Dean 1,502 ft., Cypress 1,746 ft., McClosky 1,941 ft.

Macoupin County: George Cassens 1 Ernst, SW SW SE 24-8n-6w, dry at 780 ft., no log.

Madison County: Texas Co. 1 Host, NE SE NE 18-5n-5w, dry at 2,755 ft., Aux Vases 848 ft., Devonian 1,900 ft., Silurian 1,938 ft., Trenton 2,652 ft., Platten 2,744 ft.

Richland County: J. L. Black 1 Ash, NE SE SE 18-2n-9e, dry at 3,074 ft., Barlow 2,651 ft., Ste. Genevieve 3,027 ft., McClosky 3,059 ft.

White County: W. C. McBride 1 Hasken, NE NE NE 29-6s-9e, dry at 2,405 ft., Menard 2,269 ft., Waltersburg 2,328 ft., Vienna 2,382 ft., Tar Springs 2,387 ft.

OHIO, KENTUCKY

Richville Pool Extended Southwest by Good Well

COLUMBUS.—William Pfeiffer 1 Samuel Nofsinger, Sec. 6, Bethlehem Township, Stark County, came in at 4,257,000 cu. ft. natural to extend the Richville pool ⅔ mile southwest. Clinton sand at 4,111-92 ft. payed in the white at 4,160-92 ft. Other operators will now be encouraged to test their acreage to the west of this well.

Stranges et al. 1 Mike Adams, Sec. 9, Richland Township, Belmont County, extended the Salt Sand pool near St. Clairsville ½ mile to the south. The sand was topped at 1,089 ft. and drilled to 1,091 ft. where open flow was 800,000 cu. ft. The gas blew down some but the well still gaged 550,000 cu. ft. after blowing open 24 hours.

In the Pittsfield pool in Lorain County the Ohio Fuel drilled in another good well that makes a northwest extension probable. The completion was on E. R. McConnell, Lot 96, and gaged 1,950,000 cu. ft. natural from the middle Clinton at 2,175-85 ft.

Altier Bros. 2 Minnie Beatrice, Sec. 28, Pleasant Township, Perry County, further expands the Sayre pool to the south. Medina sand at 3,834-41 ft. had 235,000 cu. ft. natural and 536,000 cu. ft. when shut in after shot.

Perry and Monroe counties each reported 4 new locations for the week, while Noble County reported 3 and Lorain, Stark, and Meigs counties each had 2. A record high of 38 completions was reported this week. Cambridge field lead with 12, and was followed by Canton with 10.

WESTERN KENTUCKY

OWENSBORO.—Felmont Corp. is rigging up cable tools for 1,150-ft. test in No. 1 Dave Roliand, 4-N-32, Daviess County, 1½ miles southwest of Whitesville.

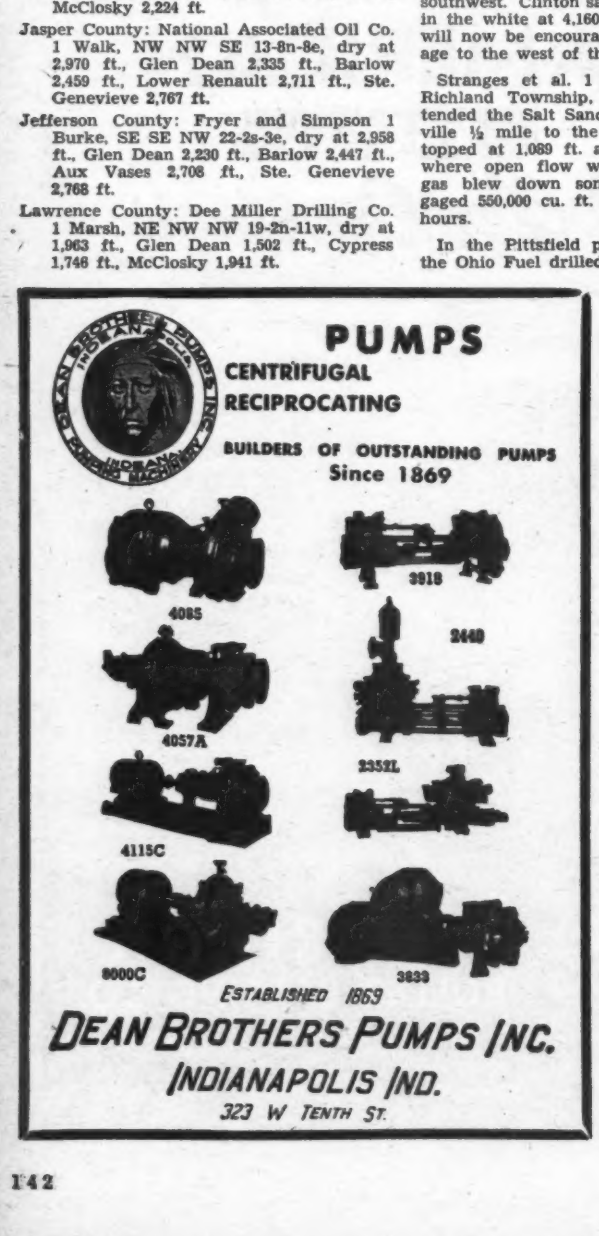
George Engle is reconditioning hole in No. 1 Williams, 25-M-25, Webster County, to test Benoist at 2,958-82 ft. Well was drilled to 3,207 ft. in 1943.

There were 10 completions during the past week, including 5 oil wells, 1 gas well, and 4 dry holes. New operations started during the week total 18.

INDIANA

EVANSVILLE.—Ashland Oil & Refining Co. 1 Bender, SW NW NE 36-3s-12w, Gibson County, recovered gas, 80 ft. oil and 60 ft. oil-cut mud on 20-minute drill-stem test at 2,537-51 ft. Total depth is 2,551 ft. The test is about 1 mile southwest of South Owensville pool.

Gulf Oil Corp. 1 Mackey, NW NE SE 9-8s-14w, Posey County, is cleaning out and testing McClosky pays at 2,648-52 ft. and 2,698-2,705 ft. Well swabbed 12 bbl. oil and 60 bbl. water in 16 hours after acid treatment of 5,000 gal.



One Man Moves 5 Tons with the ANCHOR Puller-Jack!
LOAD CHAIN
TAIL CHAIN
SWIVEL
RELEASE LOCK
ANCHOR PULLER-JACK
Here's a one-man gang that quickly repays its price in labor, time and money saved. Has 3 tons direct pulling power, or 5 tons with sheave block. Pulls 15 feet without changing hold. Can be operated upright, sideways or upside down, with lever pull away from load or toward it. Simple, strong, foolproof. Practically nothing to get out of order. Positive action, always holds. Compact, quick and easy to set up and use. Hundreds of uses for this powerful tool wherever heavy objects must be moved. Order an ANCHOR Puller-Jack today, or write for descriptive catalog.
$57.50
F. O. B. Bowerston, Ohio. Jack complete with 3 ft. steel tube handle, 15 ft. load chain with slip hook, and release lock. Longer chains available.
Easily carried and operated by one man.
THE MINING SAFETY DEVICE COMPANY
DEPT. OG • • • • • BOWERSTON, OHIO

Among the

Drilling Contractors

Charter Granted Oklahoma City Drilling Concern

Hall-Miller Drilling Co., Inc., Oklahoma City, has been granted a domestic charter by the Secretary of State for Oklahoma. F. C. Hall, Joe J. Miller, and William T. Singley, all of Oklahoma City, are the incorporators and the firm has a capital stock of $100,000.

Kansas Contractors Open Two New Oil Pools

Lowell Drilling Co. and **Harbar Drilling Co.,** both of Wichita, have opened new oil pools in Kansas. In Rooks County, Lowell and Bud Dozier hit a Kansas City lime producer in Paradise Creek (Arbuckle lime) pool with their 1 Hayes, NE NE SE 28-9-18w, producing 351 bbl. per day from 3,450 ft. In Russell County, Harbar opened Forest Hill North (Arbuckle) pool with 1 Meier, NE NE NE 20-15-12w.

McDaniel & Beecherl Drilling Co., Dallas, and Neville G. Penrose have staked 1 Cordova Union, a 6,000-ft. Ellenburger wildcat, 660 ft. north of south line and 660 ft. southeast of east-west line of north 160 acres, Section 91, Block 11, H&GN Survey, Pecos County, Texas.

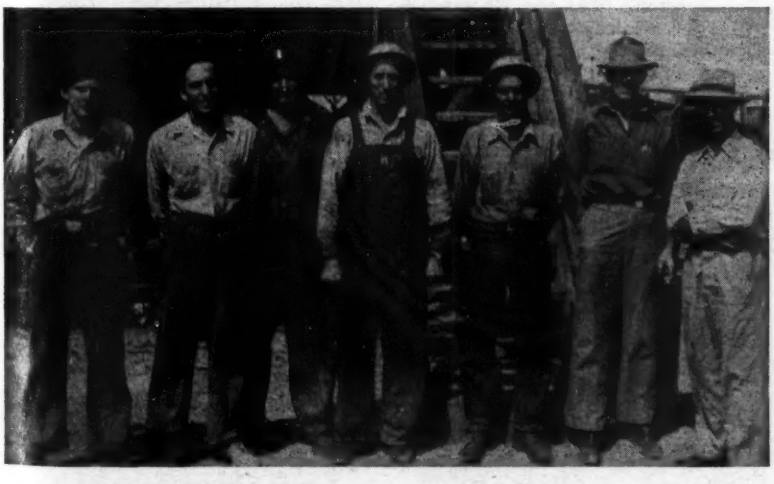
Woods Drilling Co., New Orleans, has staked another wildcat in Logan County, Oklahoma, its 1 Crabtree, NW NE NW 4-16n-1e. The test is being drilled on a seismograph high on a block assembled by George Deck and William Sinclair, Tulsa, and is being supported by Amerada Petroleum Corp., Blackwell Oil & Gas Co., and others.

Hewgley Drilling Co., Jackson, is drilling Cities Service Oil Co. 1 Jones Estate, C NW NE 19-15n-1w, Humpreys County, Mississippi.

Northern Development Co., Edmonton, Alta., is finishing Castle 2, NW 4, 11-50-2w4, in the Alberta portion of Lloydminster field.

Morgan Drilling Co., Oklahoma City, is drilling its 1 Hunter, S½ NE SE 30-5n-3w, a 10,700-ft. test, McClain County, Oklahoma.

Westlund & Johnson, Inc., Midland, Tex., has moved in rig for Cole-Darden Oil Co. 1 Phillips Petroleum Co.-State, a projected 4,700-ft. wildcat 1½ miles west of the Vacuum field in west central Lea County,



Dunlap & Graham crew and supervisory personnel on Long Beach Development Co. well, Wilmington Harbor, California. The men are: Don Coxs; K. A. Ziemer; R. C. Ziemer, C. M. Bell; C. O. Bell; D. J. Kasy, drilling superintendent, Long Beach Development Co.; and George Witzleber, tool pusher for Dunlap & Graham

PENBERTHY

"REFLEX"

WATER GAGE SET

For oil field, locomotive type and marine boilers. Water shows black — steam shows white; the water level is unmistakable. U-Bolt construction is strongest and simplest to service. Glass replaced by simply removing nuts on face of gage . . . unnecessary to work between gage and boiler. Conforms with A.S.M.E., Federal and State requirements when used for pressures specified by their respective codes.

This is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

PENBERTHY INJECTOR CO.

DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

USE 'BESTOLIFE IT'S BETTER

'BESTOLIFE—the Lead Seal Joint Compound used successfully in the Drilling and Refining Industries for years — is immediately available through more than 100 distributors in the U.S.A.

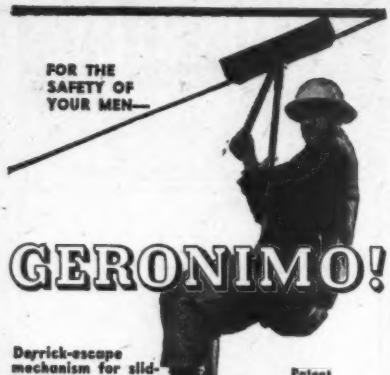
Your nearest supply house field store probably has 'BESTOLIFE in stock for immediate delivery. Use 'BESTOLIFE — it's BETTER!

EXPORT: THE NATIONAL SUPPLY CORP., 30 ROCKEFELLER PLAZA, NEW YORK

I. H. GRANCELL

1601 EAST NADEAU STREET

LOS ANGELES 1, CALIFORNIA


FOR THE SAFETY OF YOUR MEN—
GERONIMO!
Derrick-escape mechanism for sliding down a guy line from a derrick, or refinery tower
Patent Applied for.

EASILY ATTACHED OR REMOVED
EXTRA STURDY CONSTRUCTION
QUICKLY STRADDLED

POSITIVE, INSTANT BRAKE
BRONZE "No-Spark" SURFACES
FOR 5/16" to ¾" GUY LINES

GERONIMO will stand hardest wear and give unfailing protection to refinery and derrick men whose lives are endangered by fire, escaping gases or other hazards.

Write for Illustrated Folder

— MANUFACTURED BY —
CHARLIE'S MACHINE WORKS
PERRY, OKLAHOMA

— DISTRIBUTED BY —
UNIVERSAL EQUIPMENT CO.
P. O. BOX 1067 TULSA, 1, OKLAHOMA

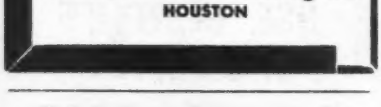
Standco
NO-SMOKE

STANDCO BRAKE LINING

Is the drillers best friend because it makes the easiest brake known and "feeds off evenly while drilling." It never scores brake rims See pages 3608-3613, Composite Catalog.

Standco Brake Lining Co.
HOUSTON

LOAD BINDERS
Drop-Forged • Malleable Iron • Steel



Drop-Forged • Heat Treated • 2 Sizes
Durbin-Boomer F-1—2 swivels, ¾, ⅛ or ½" chain
Durbin-Boomer F-2—2 swivels, ⅛, ⅜ or ⅝" chain

Malleable Iron • Heat Treated • 5 Sizes
MIDGET No. 1—1 swivel, ¼" chain
DEI-TA No. 1—1 swivel, ⅜ or ½" chain
DIXIE No. 1—2 swivels, ⅜ or ½" chain
LONE STAR 1—2 swivels, ⅜, ½ or ⅝" chain
LONE STAR 2—2 swivels, ⅛, ½ or ⅝" chain

Write for Catalog
DURBIN-DURCO
6611 Olive Street Road • St. Louis 5, Mo.

New Mexico. Phillips is said to have farmed out the acreage to Oliver & Kotyza, who made a drilling deal with Cole-Darden.

Keyes Drilling Co., Ellinwood, Kans., has completed a 3,000-bbl. producer in an echometer test to open South Burnett pool, Ellis County, Kansas. The well is the 1 Marshall, NW NW NW 25-11-18 and is 1 mile south of Burnett pool.

Delta Drilling Co., Shreveport, is planning an 8,000-ft. test, the 1 H. Y. Jackson, on a 47.65-acre tract, Hezekiah George Survey A-367, 3½ miles northwest of Tyler, Smith County, East Texas.

Mouser Drilling Co. and **Virginia Drilling Co.,** both of Wichita, have started wildcats in Stafford County, Kansas. Mouser is drilling its 1 Kasselmann, SE NW 8-21s-11w, northeast of Sandago pool, and Virginia is drilling its 1 Rusco, SW SW NW 32-22s-13w, 5 miles southwest of Drach pool.

Drilling Contractors, Ltd., Calgary, Alta., is moving rig from Beaverhill Lake area, northern Alberta, to LSD 5, 10-51-4w5, for a test of holdings of 179,000 acres in the Wabamun Lake district. Location is about 30 miles west of Leduc field and test is jointly sponsored by Anglo-Canadian Oil Co., Home Oil Co., and Calgary & Edmonton Corp.

C & A Drilling Co., Oklahoma City, has filed location for a wildcat, the 1 McCracken, SW SW SW 10-4n-5e, 1¾ miles southeast of Bebee pool, Pontotoc County, Oklahoma.

General Petroleums, Calgary, has contract for a series of wells to be drilled for Bata Petroleums east of Dina-Ribstone field and close to the Alberta-Saskatchewan boundary. **Denton-Spencer Co.** of Calgary are engineers in charge of field operations.

Puritan Drilling Co. and **Williams Drilling Co.,** Wichita, 1 Spicer, NW NW SW 24-1n-5e, southeast of Jacksonville, Wayne County, Illinois, recovered 2,000 ft. of oil on a drill-stem test of Aux Vases sand at 2,954-73 ft.

Exploration Drilling Co., Tulsa, has staked 1 R. M. Simmons, a wildcat, 660 ft. from north and east lines, Section 56, Block 21, T&P Survey, northeastern Nolan County, Texas. The test will be drilled to 6,600 ft.

V. G. Byars Drilling Corp., Tyler, Tex., has contract for four tests for C. L. McMahon, Inc., in the shallow zone of Quitman pool, Wood County, North Texas. The wells are A-1 and A-2 Pinkey Taylor, and 1-B and 2-B E. J. Taylor, all in Hazard Anderson Survey.

Skeeters & Curry, Longview, have started a 3,500-ft. test to Nacatoch and Meakin sands for D. J. Flesh, the 1 Florence L. Rosencrantz, NE SE SE 2-3s-6w, 4 miles southwest of Stuttgart, Arkansas County, Arkansas.

Zephyr Drilling Co., Tulsa, is planning a Wilcox test in southeastern Oklahoma County, Oklahoma, the 1 Larkin, NW SE 7-11n-1w, 7 miles east of Oklahoma City and 4 miles south of Nicoma Park.

Zephyr Drilling Co., Tulsa, has started its 1 James I. Larkin, C NW SE 7-11n-12w, Oklahoma County, Oklahoma.

Morrison Drilling Co., Eldorado, Kans., is the contractor for Stanolind Oil & Gas Co. 1 Winkler, NE NE NW 6-31-19, 7 miles southwest of Alford gas pool of Kiowa County, Kansas.

Threeway Drilling Co., Wichita, is making hole for H. V. Elwell on 1 Louise Sessin, NE NW SE 15-11-19, 1½ miles north of the Northeast Solomon pool, Ellis County, Kansas.

Norwood Drilling Co. is the contractor for a 5,500-ft. rotary test, the 6666 Oil Co. 1 S. B. Burnett, 1,500 ft. from north and 440 ft. from east lines, 12-5-F, Lazarus Survey, King County, Texas.

M. B. Armer, Wichita, is drilling John Lindas et al 1 Shenyen, CWL NE NE 11-8-19, a wildcat 4½ miles northeast of Webster pool, Rooks County, Kansas.

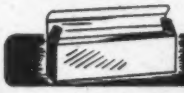
Shaw Petroleums, Lloydminster, Sask., is drilling Athlone 3, NE 5, 11-50-2w4, the latest of a series of wells for Athlone Co. in the northwest extension of Lloydminster field.

Crissman Drilling Co. and W. D. Inskeep have formed an arrangement whereby Inskeep will act as contract agent and Crissman will supervise all field operations for Crissman Drilling Co. with offices at 615 East Willow Street, Long Beach.

EMPIRE
SAND SAMPLE ENVELOPES

Specially designed and manufactured for sand samples. Used by most major oil companies. Immediate delivery of any quantity. Write for prices.

32# KRAFT
•
FLEXIBLE METAL TIE



CORE BOXES

Heavy Kraft boxes for storing Empire sand sample envelopes. These boxes are knocked down for economical flat shipment and storage.

TULSA PAPER COMPANY
TULSA PAPER CO.
P. O. BOX 10 TULSA 1, OKLA.

J. E. Trigg, Oklahoma City, is starting British-American Oil Co. 1 Atkinson, SE NW 12-21n-4w, north of Covington, Garfield County, Oklahoma.

General Petroleums, Calgary, Alta., has the contract for an important Devonian test to be drilled for Apex Consolidated Resources, Ltd., of Toronto, in Alberta in LSD 13, 11-52-2w4, about 15 miles northwest of Lloydminster. Test, which will go 2,500 ft., or about 400 ft. into the Devonian, is the first of its kind in this area.

Ed F. Moran, Tulsa, has brought in a producer for Argo Oil Corp., the 1 Dora Roberts, a wildcat in Section 294, Block 13, H&GN Survey, 13 miles northeast of Balmorhea, Reeves County, West Texas. The test flowed 72 bbl. per day from Wolfcamp at 9,917 to 10,860 ft.

Carter-Woolf Drilling Co. will drill a 2,000 ft. test, Gerald Spencer and R. M. Southard 1 Murphy Carr, SE NW NW 28-2n-3e, north of Sulphur and east of Wynnewood, Murray County, Oklahoma. The wildcat is on a 1,000-acre spread of leases.

Commonwealth Drilling Co., Calgary, Alta., is completing contracts for two tests in the Saskatchewan area of Lloydminster field, Command-Globe 6, NW 8, 15-47-27w3 and H.N.B. 1, NE 8, 10-49-27w3.

Earl Lahn, Altus, is starting a 2,000-ft. test, the Ralph Brown et al 1 Battle, SW SW NE 24-8n-27w, Beckman County, Oklahoma. The test is on a 3,500-acre block.

Nix & Meade, Odessa, is drilling the Texzona Production 1 Tunstill Brothers, Section 10, Block 56, Township 2, T&P Survey, Reeves County, West Texas.

Barnett Drilling Co., Wichita, is drilling its 1 Montgomery, NW NE NE 7-8-23, a test ¾ mile northeast of Gettysburg pool, Graham County, Kansas. **Glenn Peel Drilling Co.** tools are being used.

Moran Brothers, Inc., Pampa, Tex., have contract for Phillips Petroleum Co. 1 Bryant Edwards, J. B. Redding Survey A-971, 6 miles southeast of Henrietta, Clay County, North Texas.

B. M. Heath, Carmi, Ill., is moving in rotary for his 1 Williams-Schoeman, a wildcat, NE NE SE 36-5s-9e, White County, Illinois. Heath is drilling two other White County wells for the Indiana Farm Bureau. These wells are 1 E. Fuller, a wildcat, SW SE NW 21-5s-9e, and 1 E. F. Bingham, NE NW SW 21-5s-9e.

H & S Drilling Co., New Harmony, Ind., is moving in materials for a wildcat, Joe Reznik 1 Meyers, NE NW NW 31-1s-13w, Wabash County, Illinois. H & S has also received permit to drill its 1 K. Cunningham, 330 ft. from south and west lines C NE SW 11-2n-13w, Lawrence County, Illinois.

W. Spencer Cook, Allegan, Mich., and H. L. Wadsworth have received permit to drill 1 County of Allegan, NW SW NE 5-2n-13w, Allegan County, Michigan.

Smith-Horton Drilling Co., Tulsa, and Fordee Rhodes Oil Co. are drilling a 3,300-ft. test, the 3 Letka, SW NE NE 32-8n-7e, Seminole County, Oklahoma.

Gordon Drilling Co. has been formed as a subsidiary of Gordon Oil Co. to do drilling work for that concern. Drilling superintendent for the new company is Herb Moravy.

Warren & Bradshaw Drilling Co., Mount Vernon, Ill., is drilling a Posey County, Indiana, wildcat for The Texas Co., 1 Stevens-Knight, SE SW SW 15-6s-13w.

Merrill Drilling Co., Mt. Pleasant, Mich., is contractor for George G. Hanners 1 Jerry Vasieek, a wildcat, NW SE SE 16-17n-15w, Mason County, Michigan.

OILWELL CORDAGE

Especially designed for Oilfield needs

Drilling Cable Cat Line
Bull Rope Spinning Rope, etc.

Manufactured by

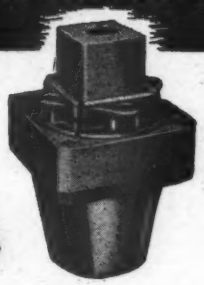
TUBBS CORDAGE COMPANY

San Francisco

Distributed by

Bethlehem Supply Co.
(Mid-Continent and California)
Allied Supply Co. Clarke-Wall, Inc.
Hickey Pipe & Supply Co.

DRIVING TORQUE CUSHIONED WITH



BJ KELLY BUSHING

Bushing Body is a solid, one piece unit with a corrugated inner core. An oil resistant synthetic rubber cushion absorbs the shock of drilling torque. Bushing is equipped with four slips inside the rubber cushion, faced with liners made of anti-friction material. These liners take all the wear and are reversible for long economical life. Ask the BJ man or see your supplier.

BYRON JACKSON CO.
Houston • LOS ANGELES • New York

FREE! TO OIL MEN this COMPREHENSIVE BULLETIN

PUMPS for the PETROLEUM INDUSTRY

Write for Bulletin No. 102 which shows why and how

BLACKMER ROTARIES

are *SELF-ADJUSTING FOR WEAR*

GATHERING PUMPS • REFINERY PUMPS
BULK STATION AND TRUCK PUMPS
HAND PUMPS • SUCTION LINE STRAINERS
Capacities to 750 GPM—Pressures to 300 psi.

BLACKMER PUMP COMPANY
1940 Century Ave., Grand Rapids 9, Mich.

SERVING THE PETROLEUM INDUSTRY FOR 40 YEARS

STATISTICS and T

WEEKLY WELL COMPLETIONS . . . WEEK ENDED AUGUST 2, 1947

	Total of all wells							Wildcat completions and discoveries									
						Cum.							Cumulative total, 1947				
	Comp.	Oil	Gas	Dry	Footage	1947	1946	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	39	19	0	*20	51,108	883	924	0	0	0	0	0	3	0	0	2	5
Pennsylvania	67	34	5	†28	106,448	1,862	2,339	0	0	1	0	1	0	0	1	1	2
West Virginia	18	3	10	5	38,889	476	413	0	0	2	2	4	0	0	7	4	11
Ohio	40	3	22	‡15	122,537	751	707	0	0	0	0	0	0	0	3	29	32
Indiana	13	3	1	9	23,893	359	208	0	0	0	0	0	13	0	0	25	38
Kentucky	10	5	1	4	17,567	364	290	0	0	0	0	0	6	0	0	28	34
Illinois	53	26	0	27	138,088	1,151	1,283	2	0	0	10	12	40	0	1	204	245
Michigan	22	11	8	3	44,199	465	469	0	0	0	2	2	5	0	9	119	133
Kansas	53	32	3	18	173,453	1,461	1,152	2	0	0	5	7	24	0	11	192	227
Neb., Mo., Iowa	1	0	0	1	6,788	3	11	0	0	0	1	1	0	0	0	3	3
Oklahoma	144	55	33	§56	411,436	2,343	1,504	5	0	1	22	28	55	3	9	398	465
Texas	197	115	20	62	879,888	5,167	4,684	5	2	3	26	36	167	31	55	772	1,025
N. Central (Dist. 7-B & 9)	62	30	0	§32	179,638	1,674	1,689	0	0	0	12	12	56	0	7	263	326
West (Dist. 7-C & 8)	51	46	0	5	247,759	1,222	997	0	0	0	2	2	16	0	3	91	110
Panhandle (Dist. 10)	14	4	9	1	42,027	249	195	0	0	0	0	0	1	0	1	4	6
Eastern (Dist. 5 & 6)	12	6	3	3	64,318	294	417	0	0	0	2	2	4	0	3	64	71
Gulf Coast (Dist. 3)	30	12	6	12	198,096	910	1,033	1	2	3	6	12	43	23	24	162	252
Southwest (Dist. 1, 2, & 4)	28	17	2	9	148,050	818	353	4	0	0	4	8	47	8	17	188	260
Louisiana	34	17	3	14	141,649	784	765	1	0	0	7	8	21	12	9	113	155
Northern	27	13	3	11	76,177	432	419	1	0	0	5	6	3	1	3	64	71
Southern	7	4	0	3	75,472	352	346	0	0	0	2	2	18	11	6	49	84
Arkansas	5	3	1	1	24,681	151	105	0	0	0	1	1	1	0	0	29	30
Mississippi	9	8	0	1	74,164	277	147	0	0	0	1	1	0	0	1	53	54
Southeastern States	3	0	0	3	12,205	31	26	0	0	0	3	3	0	0	0	27	27
Montana	13	8	4	1	26,022	147	177	0	0	1	0	1	2	0	4	14	20
Wyoming	8	7	0	1	37,259	127	98	0	0	0	0	0	7	0	2	18	27
Colorado-Utah	3	1	0	2	15,613	113	80	0	0	0	2	2	1	0	1	30	32
New Mexico	14	13	1	0	72,859	300	216	0	0	0	0	0	4	0	1	21	26
California	34	29	0	5	141,342	1,152	1,058	1	0	0	5	6	31	0	5	169	205
Total United States	780	392	112	276	2,560,088	18,167	16,656	16	2	8	87	113	380	46	119	2,251	2,796
Total previous week	693	378	64	251	2,256,246	17,387	16,105	11	1	9	95	116	364	44	111	2,164	2,683
Total August 3, 1946	551	279	69	203	1,796,158			16	1	1	67	85	298	25	70	1,931	2,324

Service wells included: *20, †24, ‡2, §1.

CRUDE PRICES AND REFINERY ACTIVITY

GRAVITY SCHEDULES

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

Gravity—	Signal Hill, Calif.*	Oklahoma, Kansas	Gulf Coast Tex.†	West Tex.‡
18-18.9	$1.60	....	....	....
19-19.9	1.65	....	....	....
20-20.9	1.69	$1.55	....	$1.42
21-21.9	1.73	1.57	....	1.44
22-22.9	1.77	1.59	....	1.46
23-23.9	1.80	1.61	....	1.48
24-24.9	1.84	1.63	$1.86	1.50
25-25.9	1.88	1.65	1.88	1.52
26-26.9	1.91	1.67	1.90	1.54
27-27.9	1.95	1.69	1.92	1.56
28-28.9	1.99	1.71	1.94	1.58
29-29.9	2.02	1.73	1.96	1.60
30-30.9	2.06	1.75	1.98	1.62
31-31.9	....	1.77	2.00	1.64
32-32.9	....	1.79	2.02	1.66
33-33.9	....	1.81	2.04	1.68
34-34.9	....	1.83	2.06	1.70
35-35.9	....	1.85	2.08	1.72
36-36.9	....	1.87	2.10	1.74
37-37.9	....	1.89	2.12	1.76
38-38.9	....	1.91	2.14	1.78
39-39.9	....	1.93	2.16	1.80
40 and above	....	1.95	2.18	1.82

*Standard Oil Co. of Calif. posting. †For crude from Daboval, El Campo, and Sandy Point. ‡Includes Lea County, New Mexico.

A.P.I. REFINERY REPORT, WEEK ENDED JULY 26

	(Thousands of barrels)					Stocks at refineries, bulk terminals, in transit and in pipe lines			
	Crude runs, daily avg.	Production							
District—		Gasoline†	Kerosine	Gas & dist. oil	Residual	Gasoline*	Kerosine	Gas & dist. oil	Residual
East Coast	896	2,099	249	1,084	1,786	20,376	7,219	13,206	9,787
Appalachian:									
District 1	93	294	33	81	103	2,201	267	491	296
District 2	59	216	39	31	87	895	177	160	107
Ind., Ill., Ky.	848	3,066	299	742	1,068	15,295	2,024	4,902	3,978
Okla., Kans., Mo.	426	1,605	168	564	504	7,055	869	2,294	1,242
Inland Texas	234	1,045	79	136	423	3,216	413	433	821
Texas Gulf Coast	1,225	3,861	628	1,533	1,754	13,202	2,883	8,100	6,424
Louisiana Gulf Cst.	363	1,042	256	558	491	4,390	1,516	2,718	1,655
No. La. and Ark.	61	152	44	50	92	1,240	461	479	134
Rocky Mountain:									
New Mexico	9	33	3	9	17	83	6	35	32
Other Rocky Mtn.	141	403	7	151	210	2,661	138	762	689
California	807	2,326	79	769	2,203	15,207	834	13,517	27,332
July 26, 1947	5,162	16,142	1,884	5,708	8,738	85,812	16,807	47,097	52,497
July 19, 1947	5,126	15,747	2,091	5,912	8,969	87,145	16,672	46,505	51,317
July 27, 1946	4,887	14,791	1,820	5,847	8,066	88,959	16,165	45,311	49,808

*Finished and unfinished. †At refineries including natural blended.

Bureau of Mines crude-oil stocks 231,357,000 bbl. as of July 26—down 45,000 bbl. One year ago 223,756,000 bbl.

FLAT CRUDE PRICES

Representative posted schedules per bbl.

East Texas	$1.95	Illinois Basin	2.07
Kettleman Hills, California*	2.14	Pecos County, Texas (Yates)	1.65
Beauregard Parish	1.90	Bradford, Pennsylvania	4.30
		Eastern Ill. and Western Ind.†	2.07
		Tomball, Texas Gulf Coast	2.10

*37°-37.9°. †35° and above.

TRENDS

DAILY AVERAGE PRODUCTION FOR WEEK

	Aug. 2 crude oil	B. of M. July demand	July 26 crude oil
Alabama	1,200	1,200	1,150
Arkansas	81,150	80,000	80,950
California	921,000	900,000	921,600
Colorado	41,390	42,000	41,900
Eastern	65,000	65,400	65,700
Florida	1,000	600	1,075
Illinois	179,400	208,000	182,600
Indiana	17,700	18,000	17,350
Kansas	292,750	290,000	296,400
Kentucky	26,050	28,000	26,200
Louisiana	430,975	425,000	429,450
North Louisiana	104,850	.....	104,900
South Louisiana	326,125	.....	324,550
Michigan	40,030	45,000	42,410
Mississippi	97,410	90,000	97,600
Montana	23,860	24,000	23,730
Nebraska	550	600	550
New Mexico	108,100	104,000	108,150
Oklahoma	385,400	390,000	384,750
Texas	2,263,675	2,190,000	2,255,250
Dist. 1 (Southwest)	22,400	.....	22,000
Dist. 2 (Southwest)	144,675	.....	138,825
Dist. 4 (Southwest)	217,100	.....	209,650
Dist. 3 (Gulf Coast)	486,450	.....	487,150
Dist. 5 (Eastern)	39,250	.....	39,175
Dist. 6 (Eastern)	113,025	.....	112,700
East Texas field	324,000	.....	324,000
Dist. 7-C (West)	39,250	.....	39,200
Dist. 8 (West)	631,475	.....	637,250
Dist. 7-B (W. Central)	37,650	.....	37,100
Dist. 9 (N. Central)	124,525	.....	124,000
Dist. 10 (Panhandle)	83,875	.....	84,200
Wyoming	118,575	118,000	117,290
Miscellaneous	.....	200	.....
Total United States	*5,095,215	5,020,000	5,094,115

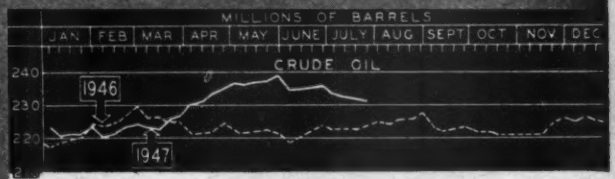
Change from prev. wk., up 1,100

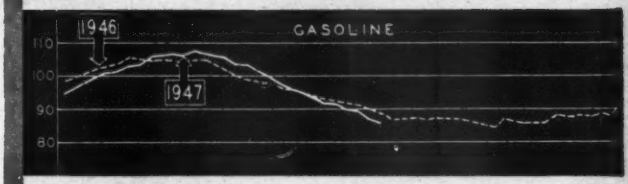
Total production January 1-August 2 ... †1,058,549,220 bbl.

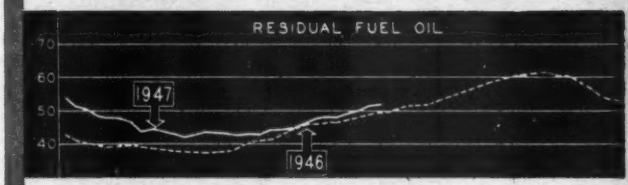
Same period last year (crude plus cond.) 1,030,602,800 bbl.

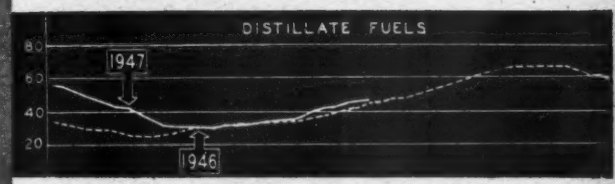
*Not incl. 40,950 bbl. condensate. †Incl. 6,294,920 bbl. condensate.

OIL STOCKS IN THE UNITED STATES

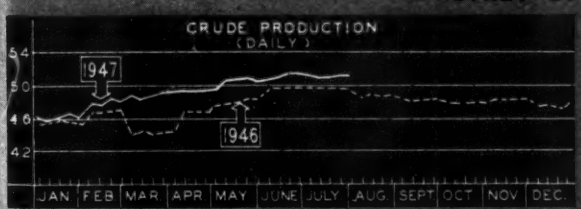


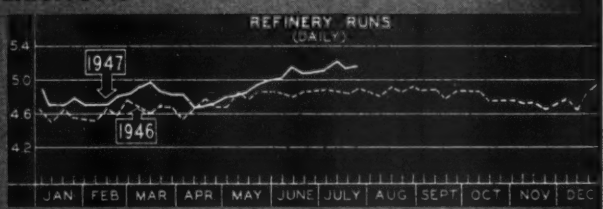




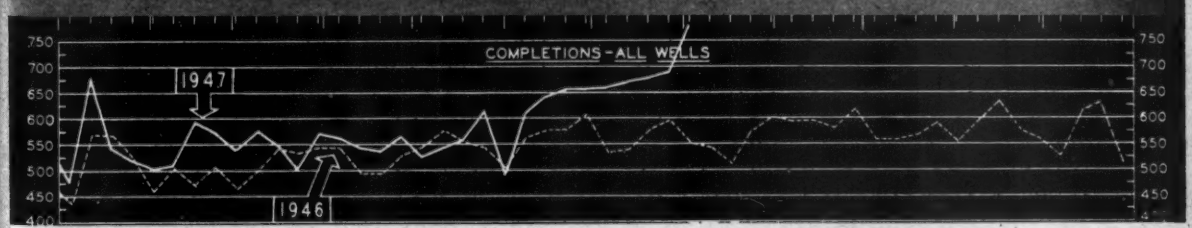


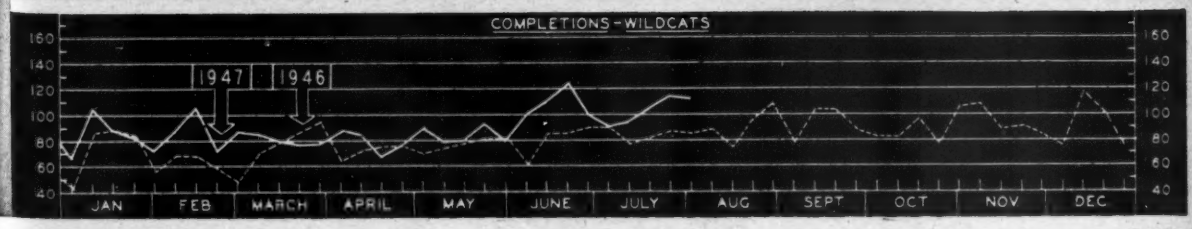
DAILY OPERATIONS





Solid line charts weekly completions, service wells in Eastern area included.





"Best Bet Yet"
SAVE YOUR TUBING!

Tubing collars worn by contact with casing steal the profit out of pumping. Patterson-Ballagh Plastic Tubing Protectors prevent both collar and casing wear. Oil-proof, wear-resistant, insulating. They are pressed onto the collar under pressure and will not come off. Made in all sizes. End your tubing troubles. CALL in your Patterson-Ballagh man.

Specify "Best Bet Yet"
PATTERSON-BALLAGH
A DIVISION OF BYRON JACKSON CO.
PLASTIC
TUBING PROTECTORS

190 E. 65th Street, LOS ANGELES 1 — 931 Russ Bldg., SAN FRANCISCO 4
6247 Navigation Blvd., HOUSTON 11 — 808 Graybar Bldg., NEW YORK 17

USE
Kraftbilt
STOCK FORMS

because . . . .

1. you solve a troublesome and costly management problem.
2. you increase clerical efficiency through economy in clerical operations.
3. you save MONEY two ways . . . forms cost and payroll time.

Write for Illustrated Catalog No. 471

ROSS-MARTIN COMPANY
STANDARD FORMS DIVISION OF
The MID-WEST PRINTING Company

419 E. 4th St., Tulsa 1, Oklahoma

MARKETS

PRODUCTS grew increasingly scarce and prices continued to move upward last week in the Mid-Continent area. Gasoline, No. 1, and No. 2, were reported nonexistent, with only "meager quantities" of kerosine available.

Suppliers reported fewer inquiries for No. 6, but demand remained strong. Price for heavy fuel oil was unchanged, with the going market still about $2.25.

Purchasers of No. 2 reported there was "none to buy" but declared some of the product was available as an exchange for gasoline. One independent refiner reported gasoline stocks completely exhausted and his plant already 200 cars behind in filling contract commitments. The refiner said products now are being sold on an "as available" basis.

Gasoline Situation Worse

One large supplier reported he had offered one Mid-Continent refiner 10⅝ cents for a shipment of regular-grade gasoline but was turned down. Previously, he said, he had made arrangements for a cargo of the product on the Gulf Coast at 10 cents but had been unable to secure barge transportation. Several refiners reported the gasoline situation "worse than expected" and said there are no signs of an immediate letup.

Buyers generally were not demanding immediate shipment, accepting gasoline over a 60-day period and burning oils over a 90-day period. Buyers asking immediate delivery were being required to furnish their own cars.

Along the Gulf Coast lubricating oils were the only products showing any signs of normalcy. One major supplier reported more lubricants available. Prices were unchanged. Movement of other products on the open spot market was reported at a standstill. One tank-car shipment of kerosine was reported at 7⅝ cents. There were no reports of spot-market gasoline sales. Suppliers continued their "no change" forecast for the remainder of August.

Sun Oil Co. increased its prices on heavy fuel oil 21 cents a barrel and its distillates from 0.3 to 0.5 cents a gallon along the Eastern Seaboard, describing the move as a step to protect the fuel-oil supply of its customers "against the added competition of those who might be tempted to convert from coal to oil on the basis of sheer economics."

No Roll-Back Seen

In New York Harbor most suppliers declared they are not contemplating a roll-back in their recent price increases to meet the lower level of Standard Oil Co. of New Jersey. Supply, they said, is too scarce to make price competition much of a factor. Most were of the opinion a two-price level can be maintained for some time at least.

Socony-Vacuum, which initiated the recent increases, issued a statement describing current prices as "no higher than necessary for properly conducting the business and for adequate income so essential for the expansion (of facilities) which is so vitally in the public interest.

Jersey Standard's lower price levels reportedly was having no great effect on the fuel-oil situation in the harbor.

Representative Quotations

Representative spot-market quotations of leading suppliers as of July 28, 1947. Figures are f.o.b. plant for tank-car shipment in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor	Texas Gulf Coast
Regular gasoline, 73-75 octane	8.25-9	10.3-10.5* 9.3-9.5†	9-10
Premium gasoline, 78-80 octane	9-10	10.2-12	9.5-10.5
42-44 w.w. kerosine	7.25-7.625	7.8-8.1	7.5-8
No. 2 straw fuel oil	6.75-7.25	6.8-7.2	6.5-7
No. 6 residual	$2.15-2.35	$2.22-2.52	$1.90-2.60

*Branded (74-76 octane); †Unbranded (74-76 octane).

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	5.875	5.375	5.625
Grade 18-55	7.05	6.45	6.75

LUBRICATING OILS

South Texas

200 vis., No. 2-3 neutral	11.5-12.5
750 vis., No. 3-4 neutral	13.5-15.25
2,000 No. 5-6 neutral	15-16.75

LUBRICATING OILS

Mid-Continent

150-160 vis. D bright stock, 0-10 p.p.	29
200 vis. No. 3 neutral, 0-10 p.p.	18-19

Western Pennsylvania

145-155 vis. 10 p.t. bright stock	43
180 vis. 0 p.t. neutral	43

CRUDE-SCALE WAX

Mid-Continent

130-132 A.S.T.M. melting point	6.75-7.75

Major Oil Supply From Imports Unlikely

(Continued from page 75)

are about five times as large as proved crude-oil reserves. They offer the disadvantages of being in the Rocky Mountain region away from the large consuming areas.

"As there is no commercial experience in the United States from which to calculate the costs of producing liquid fuels from gas, coal, or shale, we are compelled to resort to estimates which have been published by Government and industry sources now conducting research and experimentation in the field," Trisko says. "The Department of the Interior recently reported that the estimated cost of gasoline from natural gas was from 5½ to 7 cents per gallon ($2.31 to $2.94 per barrel), and from coal or oil shale from 7½ to 9½ cents per gallon ($3.15 to $3.99 per barrel), without allowing for a profit or return on investment. These estimates were based on data furnished by industry sources and modified by the Department of the Interior in accordance with its own experience. Since they are the most recent available, and since they are the result of combined government and industry experience, these estimates are used in Table 2 as bases for comparison with current crude oil and refined gasoline prices.

TABLE 2—COMPARATIVE REFINERY PRICES FOR GASOLINE FROM PETROLEUM, COAL, OR SHALE, AND NATURAL GAS
(Dollars per barrel)

Item—	Range	Median
Refined gasoline, 73-75 oct. March 19, 1947[1]	$3.05-$3.57	$3.31
Estimated crude-oil price[2]	1.70- 2.00	1.85
Gasoline from shale or coal, estimated selling price[3]	3.78- 4.62	4.20
Estimated competitive crude-oil price	2.11- 2.58	2.35
Gasoline from natural gas synthesis, estimated selling price[3]	2.94- 3.57	3.26
Estimated competitive crude-oil price	1.64- 2.00	1.82

[1]National Petroleum News, March 19, 1947. [2]Author's estimate. [3]Includes 63 cents per barrel for profit and return on investment.

"As of March 19,1947, gasoline of 73-75 octane rating was quoted at refineries in various sections of the United States at from 7.25 to 8.5 cents per gallon ($3.05 to $3.57 per barrel). These prices reflected the 25 cents per barrel increase in crude prices which became effective in March. The ratio of the estimated average current crude price of $1.85 per barrel to the median of the gasoline prices quoted is 55.9. By applying this ratio to the estimated selling price for gasoline from natural gas, coal, or shale, it is possible to arrive at an approximation of the crude prices at which these processes will be competive."

On the subject of foreign oil costs, Trisko's report points out that these figures vary with the country in which the oil is produced, the circumstances of the importing company —whether a parent company or non-affiliated firm, the transportation facilities, and the current tariff policy of the United States. At the present time, he says, tanker rates are abnormally high.

"Under present conditions, companies interested in engaging in oil imports or increasing present imports, which have no tankers of their own, or do not have tankers available for the purpose, are compelled to take charters at abnormally high costs either from the Government or foreign tanker brokers," the report says. "A general availability of the economies which can be achieved in this import cost item awaits the improvement of the tanker supply and the eventual disposition of government-owned tankers.

Production Costs Estimate

"Although precise information on production costs is not available, enough is known to permit the estimate of maximum figures beyond which costs are not likely to range. Estimates of production costs for Arabian oil have ranged from 3 to 10 cents per barrel. They appear attainable in the light of investment and proved reserves to date. For our purposes, however, the cost will be presumed to be 30 cents per barrel, to resolve all doubt in favor of high costs, and to allow for probable increase resulting from investments which will be made as production is expanded and appropriate development work carried out. . . . From the information that has been presented, it is possible to calculate a maximum landed cost in the United States for Arabian and Venezuelan oil. The data presented in Table 3 assume the use of a company-operated or foreign-flag vessel and the completion of the Middle East pipe lines; ;they allow a profit of 25 cents per barrel to the producers, and also allow a differential in favor of domestic crude for any quality differences in the foreign oil."

"The landed cost on our East Coast of oil purchased in Texas for $1.85 is approximately $2.20. The price advantage of foreign oil is apparent, but it must not be overlooked that these advantages are available in full measure only when economical transportation methods are available and used, and when a profit of no more than 25 cents per barrel is earned. A profit of more than that amount is of no consequence if there is a parent-subsidiary relationship between the seller and the purchaser. This is extremely pertinent in the light of the present policy according to which prices in foreign producing countries are based on United States prices, rather than on actual cost."

TABLE 3.—ESTIMATED LANDED COST IN UNITED STATES OF FOREIGN CRUDE OIL
(Dollars per barrel)

Item	Arabian	Venezuelan
Cost of production	0.30	$0.50
Royalty and taxes	.21	[2].35
Transportation[3]	.75	.20
United States import tax	.105	.105
Difference in refinery realization	.20	.10
Profit	.25	.25
Total cost	$1.815	$1.505

[1]Maximum estimates; current costs probably approximate no more than 15 cents in Arabia and 35 cents in Venezuela. [2]Estimated, as of 1946. [3]Assuming company-operated tanker and completion of pipe line to Mediterranean.

Army Air Forces Has Only 90-Day Supply of Gasoline

The army air forces disclosed August 1 that it had only about 90 days' supply of aviation gasoline and oil. Jet fuel also was short and overseas shortages acute, it was indicated.

The increase in commercial flying and the export of gasoline were seen by A.A.F. as among the reasons why more gasoline has not been sold to the Government.

The Air Forces said that its training program and its research and development program are being retarded due to the shortage.

Tank-Truck Shipments Show Increase in 1947

Gross revenue of petroleum-products motor carriers increased 34.7 per cent during the first 3 months of 1947, compared to the same period of 1946, while operating expenses increased 25.4 per cent, according to a first-quarter report by American Trucking Associations, Inc.

Intercity mileage petroleum-products carriers increased 19.4 per cent and intercity tonnage increased 25.4 per cent, the report said.

Operating costs were 95.1 per cent of the gross revenue during the first quarter of 1947, a considerable improvement from the same quarter last year when operating costs exceeded the gross revenue, the report showed.

Canadian Oil Output Shows Gain During May

Production of crude oil in Canada increased 424 bbl. daily during May, compared with April. Daily average production during May was 20,495 bbl.

Production of natural gas, however, dropped from a daily average of 146,871,000 cu. ft. in April to 130,973,000 cu. ft. during May.

EQUIPMENT MEN ... in the News

New Personnel Assignments In Cummins

S. J. Coffey, former manager of Cummins Diesel Sales Corp. of Illinois, has been appointed manager of

S. J. COFFEY

B. A. DULING

regions of the distribution division of Cummins Engine Co., Inc., Columbus, Ind. He will work directly under the general sales manager in supervising the activities of the regional offices. Byron A. Duling has been appointed manager of engine distribution with headquarters at Columbus. In that capacity, he will have charge of all engine distribution to Cummins dealers and to manufacturers who use Cummins diesels to power their equipment. Raymond Boll has been appointed assistant manager of the Cleveland region, with headquarters at 805 Fidelity Building, Cleveland. W. C. Phillips has been appointed assistant manager of the southeastern region. As assistant to Regional Manager C. A. Buxton, he will make his headquarters at Columbus.

District Office to Denver

Halliburton Oil Well Cementing Co. has moved its Rocky Mountain district office from Casper, Wyo., to 915 U. S. National Bank Building, Denver. The division shop and warehouse will remain at Casper. Charles T. "Mickey" McGuire, district superintendent, will be located in Denver.

Cushing to Casper

W. T. Cushing, Jr., who has been in the plant products division of National Supply Co., Houston, has been promoted to division engineer of the company's Northwest division at Casper, Wyo. The Northwest division also includes the company's stores and activities in Western Canada. J. W. Chadwich, whom Cushing succeeds, will continue in an advisory capacity and will retire at the end of the year after 18 years of continuous service with the company.

Wel-Met Company Purchased

Purchase of Wel-Met Co., Kent, Ohio, manufacturers of powered self-lubricating metal bearings and parts, has been recently disclosed by the controlling group of northern Ohio business men. Officers of the company, all members of the purchasing group, are T. L. Robinson of Hudson, president; H. Leslie Kinney of Cleveland, executive vice president in charge of sales; and Leo R. Kuntz, Cleveland, secretary and treasurer.

New Sales Office Established in Dallas

Electric Machinery Manufacturing Co., Minneapolis, announces the establishment of a new sales office in Dallas to handle its line of large motors, generators, and control equipment. H. L. Renking, formerly manager of the office at Pittsburgh, will be in charge. The new Dallas office is located at 2023 Jackson Street.

Evans and Attridge To Alberta

John D. Evans, of Lucey Export Co., New York, and Oliver Attridge, of Chattanooga, Tenn., chief engineer for the company, are spending several weeks inspecting recent developments in the Alberta, Canada, fields.

Laclede-Christy Appoints Kayser

Julius A. Kayser has been appointed assistant to the president of Laclede-Christy Clay Products Co., St. Louis.

Fricker Joins Heil

Heil Co., Milwaukee, announces the appointment of Don E. Fricker as assistant advertising manager. Fricker was in charge of advertising for Le Roi Co., Milwaukee, prior to his military service during World War II.

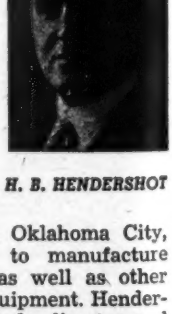
Enterprise Acquires Hendy Diesels

C. S. Herbert, executive vice president of Enterprise Engine & Foundry Co., San Francisco, announces that the company has acquired the complete line of Hendy marine and stationary diesel engines formerly manufactured by Joshua Hendy Iron Works of Sunnyvale, Calif. There will be no interruption in the continuity of sales, manufacturing, and servicing of Hendy engines. The Enterprise organization is a subsidiary of Transamerica Corp.

Tube-Kote Begins New Plant Construction

Ground-breaking ceremonies recently were held at the Tube-Kote, Inc., plant at 2520 Holmes Road, Houston, where a new factory building will be constructed at a cost of approximately $200,000. Larry Heinen, president, together with W. H. Hopkins, treasurer, and John A. Croom, secretary, turned the first spade of dirt. The new addition to the plant will enable production to be tripled.

Hendershot Organizes Tool Company



H. B. HENDERSHOT

Herman B. Hendershot recently has organized Hendershot Tool Co., 1006-1012 Southeast 29th Street, Oklahoma City. The new company has purchased the manufacturing facilities, trade name, and all assets of the Mid-Co Tool & Supply Co., Oklahoma City, and will continue to manufacture Mid-Co.'s products as well as other oil-field tools and equipment. Hendershot, who was formerly director and secretary and treasurer of Hinderliter Tool Co., which he assisted in organizing, will serve as president and treasurer of the new company. Other officers of the new company are Clark C. Wright, vice president, who was also associated with Hinderliter Tool Co. for many years and Thomas H. Kelly, secretary.

United States Steel Products Expands

United States Steel Products Co. has completed plans calling for a more than 32,000-sq.-ft. enlargement to its plant located near Dolton, Ill. Four new buildings are to be added to the existing plant. These will provide better office facilities; larger and improved locker rooms, rest rooms, and first aid facilities for plant employes. Also included is additional warehouse space for storage of sheet steel and other raw materials, and handling and mixing paints.

Waukesha Names Nelson Assistant-to-President

C. E. NELSON, JR.

President James E. DeLong of Waukesha Motor Co. has appointed Charles E. Nelson, Jr., his special assistant with the title of assistant-to-the-president. Nelson entered the organization in 1929 following several years as state wholesale representative for a major motor-car manufacturer. His earliest activities with the Waukesha company were connected with the financial department and led to his appointment as secretary and treasurer of Faegol Truck & Motor Coach Co., Oakland, which in 1933 became a subsidiary of Waukesha. Returning to Waukesha in 1934, he became factory production manager, and since June 1936, he has been director of purchases and production planning. His new duties will be in addition to his past responsibilities which he will continue to discharge.

Leyman Appoints Gunby

Dean F. Gunby has been appointed Houston district sales manager of Leyman Manufacturing Co., Cincinnati, for McGowan pumps and Kodweld products. Stocks of pumps and spare parts will be warehoused in Houston, Gunby will also have complete charge of facilities for servicing petroleum and industrial requirements in the southwest. He will maintain offices in the Jameson Building, 1903 Blodgett Street.

New York Office Change by Baker

Russ V. McIntire, New York export manager, has announced a change of location of the New York export office of Baker Oil Tools, Inc., to 11 West 42nd Street, Room 2640.

Smith and Saborio Return to Bogota

J. A. Smith, head of operations in Colombia for United Geophysical Co., S.A., and Alvaro Saborio, United Geophysical surveyor, recently returned to Bogota from a trip to the United States.

Bailey Meter Assigns Field Engineers

The last members of the 1946-47 cadet engineering class of Bailey Meter Co. have been assigned to the company's branch offices. J. H. Wilson reported to Cincinnati early in August and R. W. May will report to New York early in September.

Wheeler Speaks in Odessa

F. Ray Wheeler, petroleum engineer, Engineering Laboratories, Inc., Tulsa, described the latest improvements in bottom-hole pressure gages to approximately 70 oil-company representatives at a recent dinner held in Odessa, Tex. Wheeler, who was introduced by W. M. Reese, owner of Industrial Instrument Co. of Odessa, said the type of instruments wanted by men in the industry is one that "can repeat itself accurately." Company representatives from Iraan, Midland, McCamey, Wickett, Monahans, Wink, Denver City, Goldsmith, Kermit, Brownfield, Levelland, Artesia, Tex., and Hobbs, N. M., attended the dinner given by Industrial Instruments Co., which handles ELI products.

Gill Adds Ragatz

The California engineering and construction firm of J. B. Gill Co. recently has announced an association with Edward G. Ragatz, absorption process specialist, for the purpose of rendering a complete and advanced processing, engineering, and construction service to the oil industry in the

E. G. RAGATZ

H. R. MARSH

field of natural-gasoline recovery. Ragatz' latest technical contribution is the "Straight-Line Chart" method of evaluating absorber performance.

The Gill organization is now under the direction of Glenn J. Gill since the retirement of its founder, J. B. Gill, a year ago. Harry R. Marsh, the company's chief engineer, adds 20 years of diversified experience in the engineering and construction field to this new combination.

Gardner-Denver Sells Governor Business

Gardner-Denver has sold its governor business to Wiebmer Machine Shop, Quincy, Ill. Gardner-Denver will henceforth concentrate on its expanding business in rock drills, air compressors, pumps, and other allied products.

Commercial Filters Opens New York Office

Commercial Filters Corp., Boston, has opened a New York branch office at 92 Liberty Street. James M. Morrison is the New York district manager and is assisted by Howard C. Corwin.

Officers and directors of Wyatt Metal & Boiler Works attended the regular quarterly meeting of the board of directors recently held in Houston. Following the meeting, directors inspected Wyatt's Houston plant and office facilities which have been modernized and greatly expanded during the past several months. Shown: H. P. Willard, director, Dallas; Frank E. Austin, Jr., director, Dallas; J. Warren Jones, director, Dallas; W. H. Dwyer, Sr., director, Dallas; Walter B. Van Wart, executive vice president, Houston; Henry R. Davis, vice president, Dallas; Raleigh Hortenstine, president, Dallas; C. R. Moore, vice president, Dallas; Guy Gambrell, secretary and treasurer, Houston; George E. Gude, Jr., vice president and manager of sales, Houston; and Ralph W. Malone, assistant secretary and treasurer, Dallas

Classified Advertising

The Market Place for the Oil Industry

UNDISPLAYED

All ads except Situations Wanted, 10 cents a word. Minimum charge, $2.00 per insertion.
Situations Wanted ads, 5 cents a word. Minimum charge, $1.00 per insertion.
Centered Line, any ad, 75 cents.
Box Numbers count 9 words when replies are to be sent to our Tulsa Office. Replies forwarded without charge.

DISPLAYED, PER INCH

$9.00 per column inch per insertion. One-point border and 12-point capitals are allowed. Larger type sizes not accepted.

All classified advertising payable in advance.
10% Discount if 3 insertions are ordered at one time.
COPY DEADLINE, 9:00 a.m. Monday prior to each week's issue.

THE OIL AND GAS JOURNAL
P. O. Box 1260, TULSA, OKLAHOMA

EQUIPMENT FOR SALE

FOR SALE: Six New Kobe, 2½ inch tubing insert, pumps, one Triplex—Bargain for immediate sale. Ben Beckham, Jr., Box 134, Overton, Texas. Phone 3921.

FOR SALE: Shaffer power draw works, powered by two J. L. 1335 Buda engines compounded. Suitable for 5,000 foot work. In A-1 condition. Price $7,500. Terms. Melton Well Service, Box 1360, Seminole, Oklahoma.

FOR SALE: Ingersoll-Rand Imperial Type XG combination two cylinder gas engine and two stage gas compressor. Engine cylinders 20" stroke by 17" dia. Compressor cylinders 20" stroke; low stage 14" dia. and high stage 7" dia. In good running condition. Knapps Creek Oil Corporation, Box 367, Bradford, Pennsylvania.

TANDEMS FOR SALE
2—1941 Autocar Tandem Trucks with winches and oilfield beds. Good condition and tires. Address inquiry to P. O. Box 1083, Oklahoma City 1, Okla.

STEEL TANKS

9—883,000 gal., 55 ft. dia. x 50 ft. high 29/32 in. thick, cone bottom. Can be supplied with or without 6-compartment Dorr thickener mechanisms.
6—160,000 gal., 35 ft. dia. x 21 ft. high welded, cone bottom, ⅝ in. walls Can be furnished with or without Dorr thickener mechanisms.
1—450,000 gal., 50 ft. dia. x 30 ft. high, ⅝ in. walls.
4—106,000 gal., 30 ft. dia. x 20 ft. high.
1—16,200 gal. 10 ft. dia. x 27 ft. long, horizontal lead lined. Can be used for acid storage.

All of these tanks are UNUSED. Installed new in 1944 in a War Plant. Location: Mobile, Ala. Immediate Shipment.

WIRE, PHONE or WRITE
For details and prices

CONSOLIDATED PRODUCTS CO., INC.
17-20 Park Row, New York 7, N. Y.
Telephone: BArclay 7-0600

EQUIPMENT FOR SALE

FOR SALE: All kinds of atmospheric coolers, Tulsa, Coynoco and GR, all in first class condition. ENGLE PETROLEUM, INCORPORATED, P. O. Box 72, Mt. Carmel, Illinois.

FOR SALE: On Lease near Gladewater, Texas, 100 HP Superior Gas Engine and National G-100 Geared Power. Contact Gladewater office or Patridge, Cities Service Oil, Bartlesville, Okla.

30,500 ft. new seamless steel tubing, cold drawn, 1020 size 2.432 x .4225 wall, 12' to 19' Random Lengths. $75.00 net ton FOB Linden, New Jersey. Also approximately 250 ton misc. tubing sizes 1" to 7⅛" smaller sizes light wall larger sizes .220 to 25/32" wall. Write for complete description. $70.00 ton FOB Ohio. South Texas Pipe & Supply Company, Box 3188, Corpus Christi, Texas.

1 STAR 45 ST Spudder with Hercules engine. Both in excellent condition. No tools. Located 10 miles East of Drumright, Okla. 1 Ft. Worth Super D Spudder with practically two strings of tools, located on Lysite Mountain, Wyoming. Travco Equipment Company, 110 Midco Bldg., Tulsa, Oklahoma. Phone 5-2251.

FOR SALE: Model 55 Wichita Spudder less mast with PA-100 International engine in good condition. Located close to Pampa, Texas. Nabob Oil & Gas Company, Box 448, Amarillo, Texas.

FARM TELEPHONES. New model handset wall telephones for farm lines—prompt delivery by parcel post. Write: Farm Telephone, Dept. 316, Rogers Park Station, Chicago 26, Illinois.

FOR SALE: 6000 Ft. 6⅝" O.D. 13# Lapweld Plain End Cement Lined Second-Hand Line Pipe, 80 cents Ft. F.O.B. Fittstown, Oklahoma. The National Supply Company, 504 East Archer, Tulsa 3, Oklahoma. Phone 2-8101.

FOR SALE
STEEL STORAGE TANKS

18—10,000 Gallon Capacity Tank Car Tanks

CLEANED PAINTED TESTED
Located in Oklahoma

IRON & STEEL PRODUCTS, INC.
42 years' experience
13412 S. Brainard Avenue
Chicago 33, Illinois. PHONE BAYport 3456
"ANYTHING containing IRON or STEEL"

EQUIPMENT FOR SALE

FOR SALE: New 3" Drill Pipe with Tool Joints standard weights R-2. Box B-734, The Oil and Gas Journal, Tulsa, Oklahoma.

WELL DRILLING Machines, Spudders, Standard Outfits. Complete stock cable tools Used equipment reconditioned. Some Government surplus. Pressey & Son, Pueblo, Colorado.

WICHITA SPUDDER and string of drilling tools, sell or trade near St. Louis. J. B. Woolsey, 804 N.W. 35th, Oklahoma City, Oklahoma.

FOR SALE: Ingersoll-Rand Imperial Type 10, 2 stage belt-driven compressor with 110 hp. twin cylinder Bessemer gas engine with 20' x 54' wood frame galvanized iron building, 4 scrubber tanks, circulating coils with heavy welded tank 10' x 24' x 10" deep, air compressor with volume tank complete. Phone or write W. R. Bowman, 214 Kennedy Bldg., Tulsa, Oklahoma. Phone 2-2633 or 6-6960.

FOR SALE: 10,000 sq. ft. steel airplane landing mat, 15" x 10' Sections. Will make into portable all-weather lease road for hauling equipment, etc. 10c per sq. ft., F.O.B. Tulsa, Oklahoma. Subject to prior sale or withdrawal. Also have several light plants at bargain rates. Marshall Travis, 110 Midco Bldg., Tulsa, Oklahoma. Phone 5-2251.

FOR SALE BY OWNER
COMPLETE ROTARY RIG

Wilson Giant Draw Works 6 x 16 Oil Well Power Pump 87' Lee-C. Moore Jacknife Derrick, and all other equipment and accessories for complete rig. For particulars—

P. O. Box 1799 **Ph. 5-3606**
Tulsa, Oklahoma

FOR SALE

IN PERFECT CONDITION

2—4" Landis Pipe Cutting and Threading Machines.

2—2" Saunders Pipe Cutting and Threading Machines.

Lever Grip, complete with LANDIS dies, die heads, belts, shafting and MOTOR.

ATTRACTIVE PRICE

ALBERT & DAVIDSON PIPE CORP.
2nd Avenue and 50th Street,
Brooklyn, 32, N. Y.
WIndsor 9-6300

NEW TANK TRAILERS

2,000 Gallon Capacity
2-Compartment

With gasoline powered pump, discharge hose, squeeze nozzle, 9.00 x 20 dual rear pneumatics, air brakes, landing gear, with or without front dolly.

Also

New 1350-gallon, 2-compartment truck tanks on 6x6 G.M.C. chassis complete with hand or power pumping equipment, etc.

L. B. SMITH, INC.
Camp Hill, Pa. Phone Harrisburg 7331